Independent Planning Commission

NSW GOVERNMENT

United Wambo Coal Mine Project

SSD 7142

Including associated modifications
DA 177-8-2004 Mod 3
DA 305-7-2003 Mod 16

Review Report

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26 March 2018

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EXECUTIVE SUMMARY

The United Wambo Coal Mine Project (SSD 7142), together with modifications (DA 177-8-2004 MOD 3 and DA 305-7-2003 MOD 16), (the project) is seeking approval to expand existing open cut mining operations at the Wambo site and develop a new open cut mine at the United site to allow for the extraction of an additional 150 million tonnes of thermal and semi-soft coking coal over a period of 23 years. The project is located approximately 16 kilometres (km) west of Singleton, in the Singleton local government area.

The project is anticipated to extract up to 10 million tonnes per annum of run-of-mine (ROM) coal. The project involves:

- extension of the existing Wambo open cut targeting the Arrowfield, Bowfield and Warkworth seams;
- development of a new open cut mining area at the United site, also targeting the Arrowfield, Bowfield and Warkworth seams and additionally descending to the Vaux seam;
- ongoing use of, upgrades to, and expansion of existing Wambo and United mining infrastructure;
- realignment of a 2 km section of the Golden Highway;
- relocation of sections of 330kV and 66kV transmission lines adjacent to the Golden Highway;
- disturbance to an area of 678 hectares (ha), including 147 ha already approved for disturbance under the existing Wambo consent and disturbance of 531 ha of additional native vegetation and native grassland;
- a final landform comprising two voids; and
- a biodiversity offset strategy, comprising 2,153 ha of land, including:
  - 1,275 ha of existing native vegetation; and
  - 878 ha of land to be rehabilitated.

The associated modifications (DA 305-7-2003 – Modification 16 and DA 117-8-2004 – Modification 3) are required to facilitate the project. Modification 16 seeks to amend the current approval for the use of existing Wambo infrastructure, including extending approval for use of the coal handling and preparation plant, increasing the currently approved capacity of the ROM receival facility, and integration of site water management systems. Modification 3 seeks to extend the current approval for use of the coal handling and train loading facilities and increase approval of the number of trains from a maximum of six trains to a maximum of eight trains per day.

On 12 December 2017, the Minister for Planning (the Minister) requested that the then Planning Assessment Commission, now known as the Independent Planning Commission (the Commission), conduct a public hearing and review the merits of the project, with consideration of the likely economic, environmental, social and other impacts. The Commission notes that amendments to the *Environmental Planning and Assessment Act 1979* entered into force on 1 March 2018, before the completion of the report. However, this does not affect the Minister's request and the steps taken by the Commission in conducting the review.

The Commission was constituted of Mr Gordon Kirkby (chair), Mr John Hann and Mr Tony Pearson. The Commission examined the documents referred to in the Terms of Reference set out by the Minister, including the Environmental Impact Statement, Response to Submissions and all relevant information relating to the project. The Commission also received public submissions, held a public hearing, visited the site and surrounds, met with the applicant, and met with the Department of Planning and Environment (the Department).

It is important to note that the role of a Commission review is not to determine if a project should or should not be approved. The role of a review is to consider the information and assessment provided to date, consider the views of the community and provide findings and recommendations that will need to be considered and factored into the ongoing assessment process.

The Commission notes that the Department's Preliminary Environmental Assessment Report (PAR) is a preliminary assessment of the merits of the project. The assessment considered the potential impacts of the project with regard to, but not limited to, air quality, noise, vibration and blasting, biodiversity, final landform and rehabilitation, water resource, transport, economic, social and cultural, and Aboriginal and non-Aboriginal heritage impacts. Other issues identified in the PAR include agriculture, soil and land resources, visual, waste, hazards, public infrastructure, and interactions with neighbouring mines.

Giving consideration to the information available, views expressed at the public hearing and submissions received, the Commission's preliminary view is that the project has merit if it can satisfactorily and genuinely address the various recommendations contained within this review report. The Commission notes that its view may change on any determination decision, including because of the provision of additional information in response to this review, information provided to the Commission independently of this review, additional matters raised in undertaking its final assessment of the project, or other relevant factors. The Commission also notes that conditions of consent have not formed part of this review and would need to be given detailed consideration at the determination stage.

At this stage, the Commission considers the key issues that require further information and consultation with relevant agencies include noise, vibration and blasting, air quality, biodiversity, final landform and rehabilitation, water resources, visual impacts and transition to the joint venture.

RECOMMENDATIONS

Noise, Vibration and Blasting

R1 The Commission finds that the assessment of noise impacts would benefit from the adoption of the NPI in all components of the noise assessment as it has done for low frequency noise. The applicant and the Department should consider the opportunity to adopt the NPI in all components of the noise assessment as this would allow for the project to be assessed and considered under guidelines that represent current best practice.

R2 The Department should adopt their suggested PSNLs in any conditions of consent.

R3 The applicant and the Department should demonstrate that the modified consents for the Wambo CHPP, rail and underground operations can achieve the PSNLs adopted by the Department in its assessment of this project.

R4 The applicant and the Department are to confirm how an increase in afternoon traffic noise is predicted to result in a reduction in noise emissions. Noting that the equivalent morning period is predicted to increase by 2.7-2.9 dB(A).

R5 The applicant and the Department are to confirm total required rail movements for the proposed joint venture and for the ongoing Wambo underground operations. The final assessment must include consideration of any cumulative rail generated noise impacts from the Wambo rail spur.

R6 The applicant must provide to the Department a revised noise contour map that utilises 1 dB(A) noise contours.

R7 Based on the revised noise contour mapping, the applicant and the Department must clarify noise impact affectation at sensitive receiver locations. Subject to the outcome of this mapping, the Department should re-assess the application of the VLAMP.

R8 The applicant shall provide a breakdown of all acquisition rights and mitigation rights for all properties within 3km of the project boundary and the consents under which they are entitled to these rights.

R9 The applicant and the Department should ensure that any updated noise assessment accurately reflects current land ownership.

R10 The applicant is requested to provide details of the negotiated agreement process and the form of the standard agreement in relation to blast exceedance affected residences to allow consideration of its effectiveness as a mitigation measure.

R11 The applicant must provide details demonstrating how it will avoid exceeding blast criterion (receiver 19 excluded). The Department should consider how such details could be included in a statement of commitments or a condition of consent.

R12 The applicant should propose appropriate conditions and/or commitments to the Department to undertake regular condition inspections of buildings within 2 km of project extraction areas.

Air Quality

R13 The applicant and the Department should consider the current NEPM and EPA's Approved Methods 2016 in its AQIA and give consideration to the adoption of these updated guidelines for the project.

R14 The applicant must fully revise and update its AQIA incorporating the additional modelling undertaken in response to the Ramboll review.

R15 The Department should confirm that the recommendations of the Ramboll review have been fully considered and, where appropriate, adopted by the project or secured through conditions of consent.

R16 The applicant must demonstrate how it intends to actively monitor blast fume impacts and concentrations at the project boundary to ensure compliance with relevant standards.

R17 The Commission recommends that the applicant and the Department demonstrate that all reasonable measures to reduce GHGE have been explored, including, but not limited to, diesel emissions.

R18 The Commission finds that deferring pollution reduction measures until such time in the future when a PRP may be implemented is not satisfactory. The Commission recommends that the applicant explore opportunities to make commitments to pollution reduction prior to any determination of the project.

R19 The Commission supports the EPA's objective of establishing baseline diesel combustion emissions at mine sites and identifying mitigation measures and site-specific controls to further reduce emissions over time. The applicant should adopt such an approach and provide relevant information demonstrating how it will continue to reduce emissions over time.

R20 The Commission requests evidence of the policies and protocols in place to manage mine-owned residences, including clarification as to whether termination rights are only triggered in relation to dust exceedances, or whether termination at any time is a general at will right of occupancy of a mine owned residence.

R21 The applicant has committed to develop its existing real-time meteorological and air quality monitoring network. The applicant is to demonstrate how it intends to achieve this and the Department should consider the implementation of this commitment by way of conditions of consent.

Biodiversity

R22 The Commission supports the Department's position regarding pre-clearance surveys and would recommend the development of appropriate conditions of consent.

R23 The applicant should clearly demonstrate its commitment to the monitoring of all GDEs in a manner consistent with what is currently required on the site.

R24 The applicant must provide further details on project staging accompanied by accurate mapping. The staging must correspond with the project's biodiversity offsetting obligations. The information should include, but not be limited to, a detailed description of each project stage, what it represents and approximate timing, the specific biodiversity offset requirements for each project stage and staging of rehabilitation commitments.

R25 The applicant and the Department must clarify what the project's total offset requirement is alongside what has been secured at the time of any final determination.

R26 The applicant must provide an assessment of recently secured offset sites (or sites secured subsequent to this report) and update its Biodiversity Offset Strategy. The Department and OEH shall assess the adequacy of any such acquired sites.

R27 The applicant shall demonstrate that it has sufficient offsets secured and/or identified for all stages of the project prior to final determination of the project and a clear and detailed strategy for meeting future unsecured offsetting obligations required under the project. Additionally, assumptions in relation to the probability of purchasing additional land based offsets should be disclosed together with a reconciliation to any historical experience in undertaking such purchases.

R28 The Department should confirm the current status of discussions with the Department of Environment and Energy (DoEE) and OEH regarding offset requirements and give consideration to appropriate conditions of consent to reflect agency requirements.

R29 The applicant should demonstrate if additional land, beyond the proposed 878 ha of 'credit-generating' rehabilitated woodland is capable of equivalent outcome.

R30 The Department and OEH should review the 'Assessment of Mine Rehabilitation Against Central Hunter Valley Eucalypt Forest and Woodland (CHVEFW) CEEC', commissioned by the NSW Minerals Council and prepared by Umwelt and provide advice to the consent authority regarding the report's relevance to the assessment of the project.

Final Landform and Rehabilitation

R31 The applicant and the Department should give thorough consideration of the full range of rehabilitation options, including filling of voids. This work must include a detailed assessment of any beneficial and/or adverse environmental consequences of filling voids, including a detailed assessment of salinity and water related impacts for all options.

R32 The applicant must provide a discounted costing evaluation for a final landform outcome that eliminates voids.

R33 The applicant should further consider potential final land use options and the feasibility of delivering the options presented in its application documentation. The Commission recommends consulting Singleton Council as part of this process.

R34 The applicant should demonstrate how it can ensure successful staged rehabilitation, in the short, medium and long-term, in accordance with its stated biodiversity outcomes. In particular, it must clearly demonstrate matching of the timing of staged mine development with the biodiversity offset requirements.

R35 The applicant should provide further and better evidence to support the suggested ability to establish rehabilitated woodland communities to the requisite extent and standard specified in the rehabilitation offset plan.

R36 The Department should consider establishing conditions, should the project be deemed suitable to proceed, that ensure any rehabilitation outcomes intended to be relied upon by the applicant for offsetting are, in fact, able to achieve the requisite standards and within specified time periods.

Water Resources

R37 The applicant and the Department must confirm the revised total catchment area of any final voids based on the revised final landforms presented in the applicant's RtS and provide details of impacts predicted to be associated with any net catchment loss.

R38 The applicant and the Department must confirm the extent of HRSTS credits held by the project.

R39 The applicant and the Department shall provide additional information and assessment regarding the extent of any cumulative impact from both the project and other mining operations on the downstream environment.

R40 The applicant should confirm why only 27 of 77 bores and 11 of 24 VMPs are currently monitored under Groundwater Monitoring Programs.

R41 The applicant and the Department should confirm the extent to which privately owned bores and mine owned bores, located within the alluvial aquifers, would be impacted by the project.

R42 The applicant should provide details of the proposed additional monitoring bores, including periodic sampling of stygofauna, to account for recommendations made in its EIS.

Matters of Environmental Significance

R43 The Department should provide additional clarity regarding satisfaction of the IESC's requirements. Alternatively, the Department should provide correspondence from the IESC to confirm its satisfaction with the revised project.

Visual Impact

R44 The applicant and the Department should give further consideration to appropriate visual mitigation measures to address potential visual impacts resulting from the project on private residences, the Golden Highway and other viewpoints identified in the EIS.

(Recommendations continue over the page)

Transition to Joint Venture

R45 The applicant shall provide a comprehensive transition to Joint Venture Strategy/Framework, including specific details on staging and/or triggers for when certain activities require a certain action, including (but not limited to):

- justification for duration of any transition process and conditions precedent for full commencement of all aspects of the joint venture open cut operations;
- a strategy for managing environmental compliance matters associated with the joint venture as separate from Wambo underground operations;
- a framework for managing transition to full Glencore management, particularly in the short term when both Peabody and Glencore will be managing distinct, and adjacent, open cut operations (in addition to the Wambo underground operations);
- Community Consultative Committee (CCC) process and structure of a CCC for the overall mining complex, with the view of establishing a regional CCC;
- Environmental Protection Licensing, including licences that would require amendments under the joint venture;
- monitoring (air, noise) required under existing consents and how this would be managed under a joint venture arrangement; and
- Environmental Management Plans, triggers for transition to management plans likely to be required under the joint venture.

R46 The applicant shall provide a summary of the proposed total combined ROM coal outputs of the proposed joint venture open cut operations and the existing Wambo underground operations. Total proposed ROM production shall be reconciled against proposed maximum rail haulage rates.

R47 The Department shall incorporate a clear framework into the draft conditions of consent, to ensure that environmental management is appropriately transitioned from the existing consent to the new consent, should approval be granted.

Independent Planning Commission NSW Review Report 2018
United Wambo Open Cut Coal Mine Project (SSD 7142)
Including associated modifications (DA 177-8-2004 MOD 3 and DA 305-7-2003 MOD 16)

1. INTRODUCTION

On 28 November 2017, the Minister for Planning issued a request to the Chair of the then Planning Assessment Commission, now Independent Planning Commission (the Commission) to carry out a review of the United Wambo Coal Mine Project (the project) and to conduct a public hearing.

The United Wambo joint venture (the applicant) is seeking approval to expand existing open cut mining operations at the United and Wambo sites, to allow for the extraction of an additional 150 million tonnes (Mt) of thermal and semi-soft coking coal over a period of 23 years.

Ms Lynelle Briggs AO, the then Chair of the Commission, nominated Mr Gordon Kirkby (chair), Mr John Hann and Mr Tony Pearson to constitute the Commission for the review.

1.1 Existing Mine Operations

The United and Wambo coal mines are neighbouring mining operations located along the south-western extent of the area of coal mining activity in the Hunter Valley. The project is located approximately 16 kilometres (km) west of Singleton, in the Singleton local government area. **Figure 1** shows the regional context of the project, including its relationship to nearby mines, Wollemi National Park, rivers and creeks, and towns and villages *(three pages over).*

1.1.2 United Coal Mine

The existing United Coal Mine is owned by United Collieries Pty Limited, which represents a partnership between a wholly owned subsidiary of Glencore Coal Pty Limited (Glencore) 95% ownership, and the Construction, Forestry, Mining and Energy Union (CFMEU) 5% ownership. Glencore maintains responsibility for the management of the mine.

Development consent for coal mining was originally granted in the early 1980s, with open cut and auger mining commencing in 1989. In 1991, the United and Wambo coal mines exchanged portions of their adjacent mining leases to create stratified lease areas, which allowed Wambo to access additional open cut resources and United to access additional underground resources. Following the lease exchange, United commenced underground mining in 1992.

Since then, United has focussed on underground coal extraction using continuous miners, bord and pillar mining, and longwall panels. The most recent development consent, DA-410-11-2002, was granted on 21 November 2003 by the then Minister for Planning and Infrastructure under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The consent permitted:

- underground extraction of up to 2.95 million tonnes per annum (Mtpa) of saleable coal until 2012;
- processing of coal on-site at its coal handling and preparation plant (CHPP); and
- transport of coal by truck to the Wambo or Mount Thorley coal loaders for subsequent rail transport to market.

In March 2010, prior to expiry of consented mining operations, United placed its operations on care and maintenance while it undertook further exploration activities and investigated the future mining

potential of the site. The United consent, as modified, (DA-410-11-2002-i), remains active for the purposes of mine care and maintenance activities, and rehabilitation and mine closure obligations.

1.1.3 Wambo Coal Mine

The existing Wambo coal mine is owned and operated by Wambo Coal Pty Limited (Wambo Coal), a subsidiary of Peabody Energy Australia Pty Limited (Peabody). Peabody Australia Mining Pty Ltd (PAM) is an intermediate holding company. Wambo Coal is a controlled subsidiary of PAM.

Mining operations commenced on the site in 1969 and have included extraction of coal using open cut truck and excavator methods and underground mining methods. The mine currently consists of underground and open cut mining operations, an on-site CHPP, rail spur and rail loading facilities.

Current operations are permitted under two Ministerial development consents granted under Part 4 of the EP&A Act, including:

- DA 305-7-2003 – open cut and underground mining operations, granted consent on 4 February 2004 and subsequently modified 15 times; and
- DA 177-8-2004 – associated rail operations, granted consent on 16 December 2004 and subsequently modified twice.

Under the existing consents, Wambo is permitted to:

- extract up to 14.7 Mtpa of run-of-mine (ROM) coal, comprising:
  - up to 8 Mtpa of ROM coal from its open cut mining operations until 2020; and
  - up to 9.75 Mtpa of ROM coal from its underground mining operations until 2032;
- process this ROM coal at its on-site CHPP; and
- transport up to 15 Mtpa of product coal by rail, utilising a maximum of six trains per day.

The Wambo rail operations consent includes the operation of trains servicing the Wambo train loading facility via Mt Thorley to the Main Northern Rail Line spur line.

Currently, Wambo is extracting coal from the South Bates Underground Mine, accessed from the highwall of the former South Bates open cut, and has approval to continue mining at approved rates until 1 March 2032. Open cut operations are currently situated in the Montrose and Montrose East pits, toward the northwest of the site, with mining approved to continue in these areas until the end of 2020. Wambo currently provides employment for approximately 250 people.

1.2 United Wambo Joint Venture

On 25 November 2014, Glenore and Peabody signed a 50:50 joint venture agreement to facilitate the development and continuation of open cut mining at both sites. Exploration activities have identified the potential for the life of the Wambo open cut to be extended through the extraction of deeper coal resources beneath the existing Montrose pit, together with a new open cut mining area at the United site.

The joint venture agreement establishes that Wambo would continue to operate the currently approved Wambo open cut operations in the short term, in line with the requirements of DA 305-7-2003. If approval is obtained for the project, United would eventually assume operational responsibility for all open cut mining activities at both the Wambo and United sites, under a single consolidated development consent.

Wambo's underground mining operations do not form part of the joint venture agreement and would continue to be owned, operated and managed by Wambo. In addition, Wambo would retain responsibility for the ongoing management and operation of its CHPP and train loading facilities. However, these facilities would receive, process and export all ROM coal extracted from the project, together with coal from Wambo's underground mining operations.

Although the CHPP has existing approved capacity to handle the increased throughput, at 14.7 Mtpa, some amendments would be required to the existing Wambo development consents to integrate these with the project, including to permit an increase in the maximum daily rail movements (see **Section 3.1**).

If approval is obtained for the project, the joint venture agreement would replace the existing stratified lease agreement executed in 1991 and provide for the combined management of lease areas. Any necessary renewals to mining leases held by the parties, would reflect these arrangements. The applicant's mining lease tenements are provided at **Figure 2** *(two pages over).*

2. THE COMMISSION'S REVIEW TASK

2.1 Terms of Reference

The Minister's request was issued on 28 November 2017 under section 23D of the EP&A Act and clauses 268R and 268V of the *Environmental Planning and Assessment Regulation 2000*. A copy of the Terms of Reference is provided in **Appendix 1.**

The Terms of Reference are as follows:

1. *Carry out a review of the United Wambo Open Cut Coal Mine Project, by:*
    a. *considering the EIS for the development, the issues raised in submissions, the response to submissions, any other information provided concerning the development by the Applicant and any information provided during the course of the review or as part of the public hearing;*
    b. *considering the likely economic, environmental and social impacts of the development in the locality, the region and the State;*
    c. *assessing the merits of the development as a whole, having regard to all relevant NSW Government policies and guidelines; and*
    d. *providing recommendations on any additional reasonable and feasible measures that could be implemented to avoid, minimise, and/or manage the potential impacts of the development;*
2. *Hold a public hearing during the review as soon as practicable after the Department of Planning and Environment provides its preliminary assessment report to the Commission; and*
3. *Submit its final report on the review to the Department of Planning and Environment within 12 weeks of receiving the Department's preliminary assessment report, unless otherwise agreed with the Secretary of the Department.*

The Commission notes that amendments to the EP&A Act entered into force on 1 March 2018, before the completion of the report. However, this does not affect the Minister's request and the steps taken by the Commission in conducting the review.

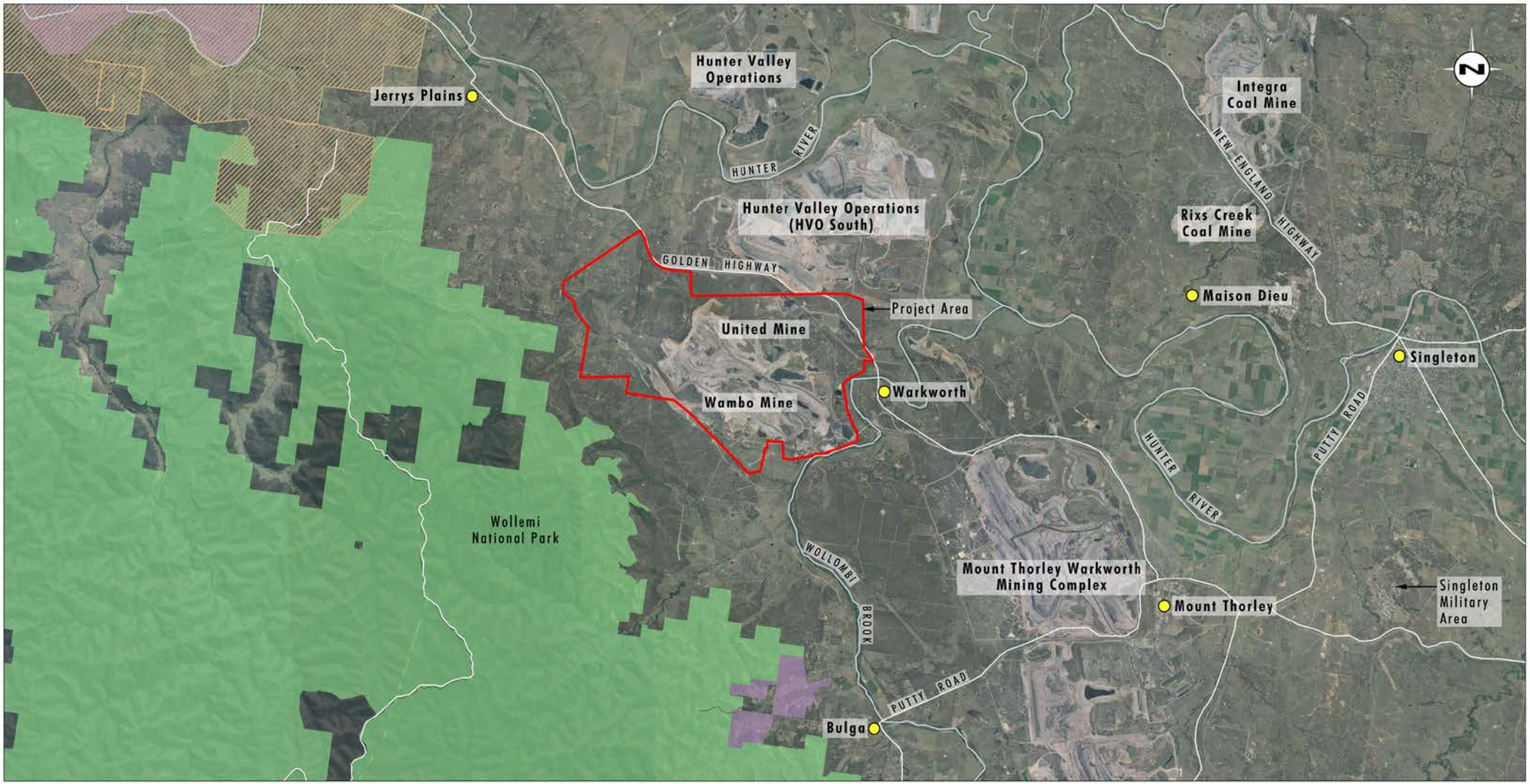

Image Source: AAM (2012), United (2015), Google Earth - CNES/Astrium 2016, Sinclair Knight Merz 2016, (2008)
Data Source: Glencore (2015), Minview (2015)

0 2.5 5.0 7.5km
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Legend
- Project Area
- National Park
- SRLUP Viticulture CIC
- SRLUP Equine CIC
- Road
- River

Figure 1: *Regional Context, Source: Environmental Impact Statement, Umwelt, August 2016*

FIGURE 1.2
Regional Context

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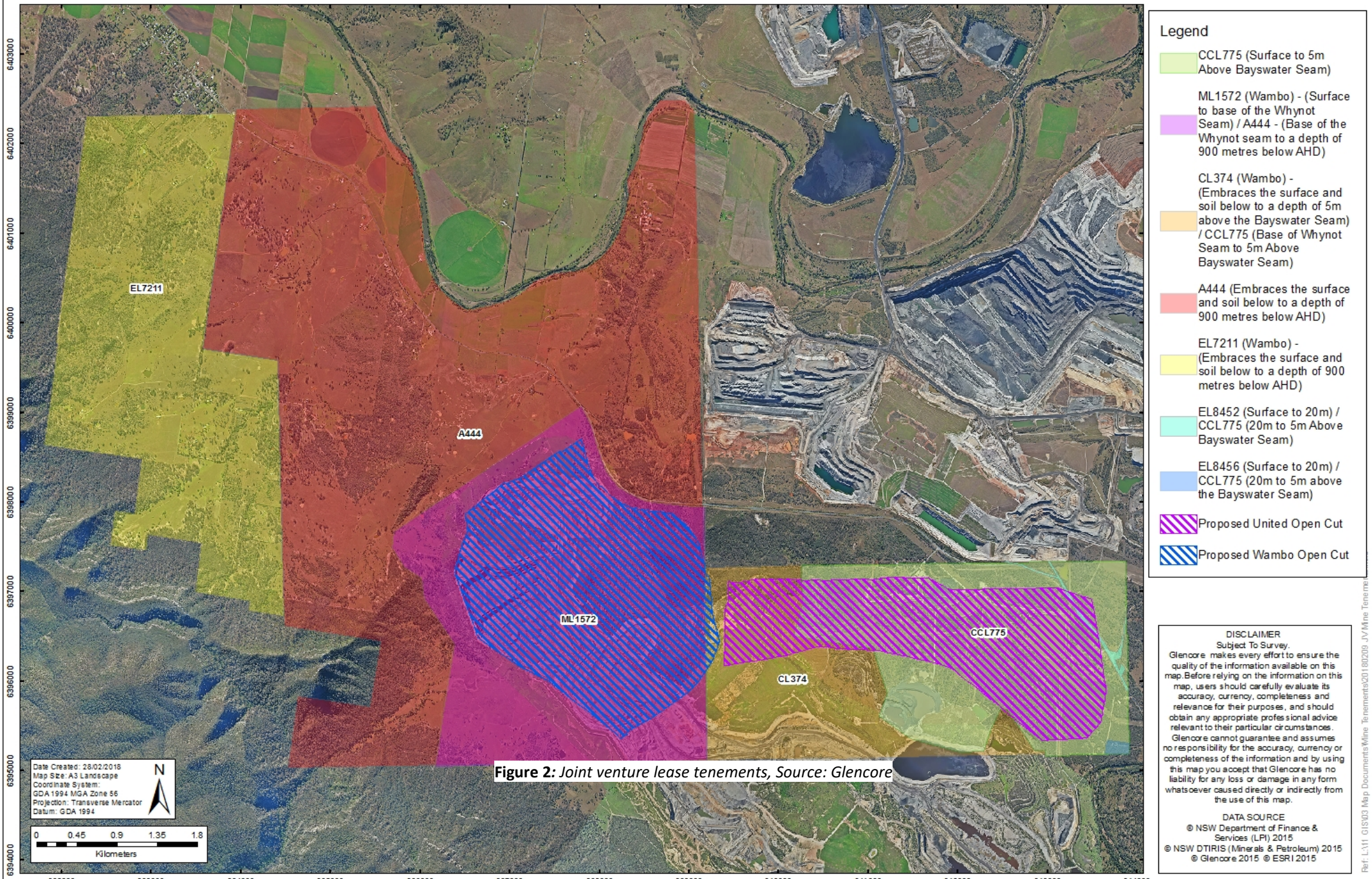
United Wambo Project

United Wambo Project JV Tenements

GLENCORE
Coal Assets Australia
www.glencore.com



Legend

- CCL775 (Surface to 5m Above Bayswater Seam)
- ML1572 (Wambo) - (Surface to base of the Whynot Seam) / A444 - (Base of the Whynot seam to a depth of 900 metres below AHD)
- CL374 (Wambo) - (Embraces the surface and soil below to a depth of 5m above the Bayswater Seam) / CCL775 (Base of Whynot Seam to 5m Above Bayswater Seam)
- A444 (Embraces the surface and soil below to a depth of 900 metres below AHD)
- EL7211 (Wambo) - (Embraces the surface and soil below to a depth of 900 metres below AHD)
- EL8452 (Surface to 20m) / CCL775 (20m to 5m Above Bayswater Seam)
- EL8456 (Surface to 20m) / CCL775 (20m to 5m above the Bayswater Seam)
- Proposed United Open Cut
- Proposed Wambo Open Cut

Ref: L:\11 GIS\03 Map Documents\Mine Tenements\20180209 JV Mine Tenements.mxd

Figure 2: *Joint venture lease tenements, Source: Glencore*

3. CURRENT PROPOSAL

3.1 Project Proposal

The applicant is seeking to integrate open cut mining operations across the Wambo and United sites under a single development consent. The project comprises the following key components:

- extension of the existing Wambo open cut allowing for the recovery of approximately 66 Mt of ROM coal through an increase in depth of mining from approximately -30m Australian Height Datum (AHD) to -105m AHD, targeting the Arrowfield, Bowfield and Warkworth seams;
- development of a new open cut mining area at the United site, on the site of the former United Colliery, allowing access to approximately 110 Mt of ROM coal through extraction to a depth of approximately -155m AHD, also targeting the Arrowfield, Bowfield and Warkworth seams, and additionally descending to the Vaux seam;
- ongoing use of, upgrades to, and expansion of existing Wambo and United mining infrastructure;
- realignment of a 2 km section of the Golden Highway;
- relocation of sections of 330kV and 66kV transmission lines adjacent to the Golden Highway;
- disturbance to an area of 678 ha, including 147 ha already approved for disturbance under the existing Wambo consent and disturbance of 531 ha of additional native vegetation and native grassland;
- final landform comprising two final voids; and
- biodiversity offset strategy, comprising 2,153 ha of land, including:
  - 1,275 ha of existing native vegetation; and
  - 878 ha of land to be rehabilitated.

The project is anticipated to extract up to 10 Mtpa of ROM coal, enabling extraction of an additional 150 Mt of ROM coal over a period of 23 years.

The general arrangement of the project is shown in **Figure 3** (two pages over).

Harmonisation Modifications

In addition to SSD 7142, the joint venture submitted two separate modification requests seeking to modify existing Wambo development consents (DA 305-7-2003 and DA 177-8-2004) to facilitate changes to existing mining infrastructure within the project area. The modifications seek to better reflect the operational responsibilities under the joint venture and to align the historical consents with the proposed project.

The proposed modifications are described below.

DA 305-7-2003 – Modification 16 seeks approval to:

- extend the current approval for the use of existing Wambo infrastructure, including:
  - the Wambo CHPP;
  - the mine infrastructure area (MIA) and site offices;
  - explosives magazine and hydrocarbon storage facilities;
  - access roads and internal haul roads;
  - water management system;
  - tailings and reject management facilities; and
  - other ancillary infrastructure and associated activities;
- upgrade existing Wambo washbays, workshop capacity, fuel farm and stores areas;
- upgrade the administration, car parking and bathhouse facilities in the Wambo MIA;

- upgrade and/or modify ancillary infrastructure and services including power and telecommunication infrastructure;
- place additional tailings from the project within the project's open cut voids and cap with overburden and coarse rejects;
- allow the Wambo CHPP to receive coal from the project for processing and stockpiling prior to being transported from the train loading facility;
- increase the capacity of the ROM receival facility for the open cut operations; and
- allow ongoing exchange of water between the United and Wambo sites to allow for integration of water management systems.

DA 117-8-2004 – Modification 3 seeks approval to:

- extend the current approval for the use of the coal handling and train loading facilities, including the rail spur, rail loop, coal reclaim area, product coal conveyor, train load-out bin and refueling infrastructure and ongoing receipt of coal from both Wambo and United; and
- increase approval of the number of trains utilising the train loading facility, from a maximum of six trains to a maximum of eight trains per day.

3.2 Department's Preliminary Assessment Report

On 12 December 2017, the Commission received the PAR, prepared by the Department of Planning and Environment (the Department).

The PAR considered the merits of the proposal, its strategic and statutory context, public and agency submissions, the applicant's response to submissions and additional information submitted by the applicant throughout the assessment process. The report considered a range of government policies, including, but not limited to, State Environmental Planning Policies, Regional Land Use Policies (such as the Upper Hunter Strategic Regional Land Use Plan). A list of the relevant statutory considerations has been included in Appendix D of the PAR. The Department has also provided a preliminary assessment of the following key issues:

- air quality;
- noise;
- blasting and vibration;
- biodiversity;
- final landform and rehabilitation;
- water resources;
- transport;
- economics;
- social and cultural; and
- Aboriginal and historic heritage.

Following publication of the Response to Submissions (RtS), the Department commissioned independent expert reviews of two assessment issues:

- air quality review, undertaken by Ramboll Environ Australia Pty Ltd; and
- economic review, undertaken by the Centre for International Economics (CIE).

The Department's preliminary assessment concludes that the project represents a logical and strategic extension of open cut mining operations across the Wambo and United sites. The Department considers that the collaborative approach adopted by the joint venture would allow for the most efficient recovery of an additional 150 Mt of ROM coal, make use of the existing Wambo CHPP and rail infrastructure, and extend the life of mining operations by 23 years.

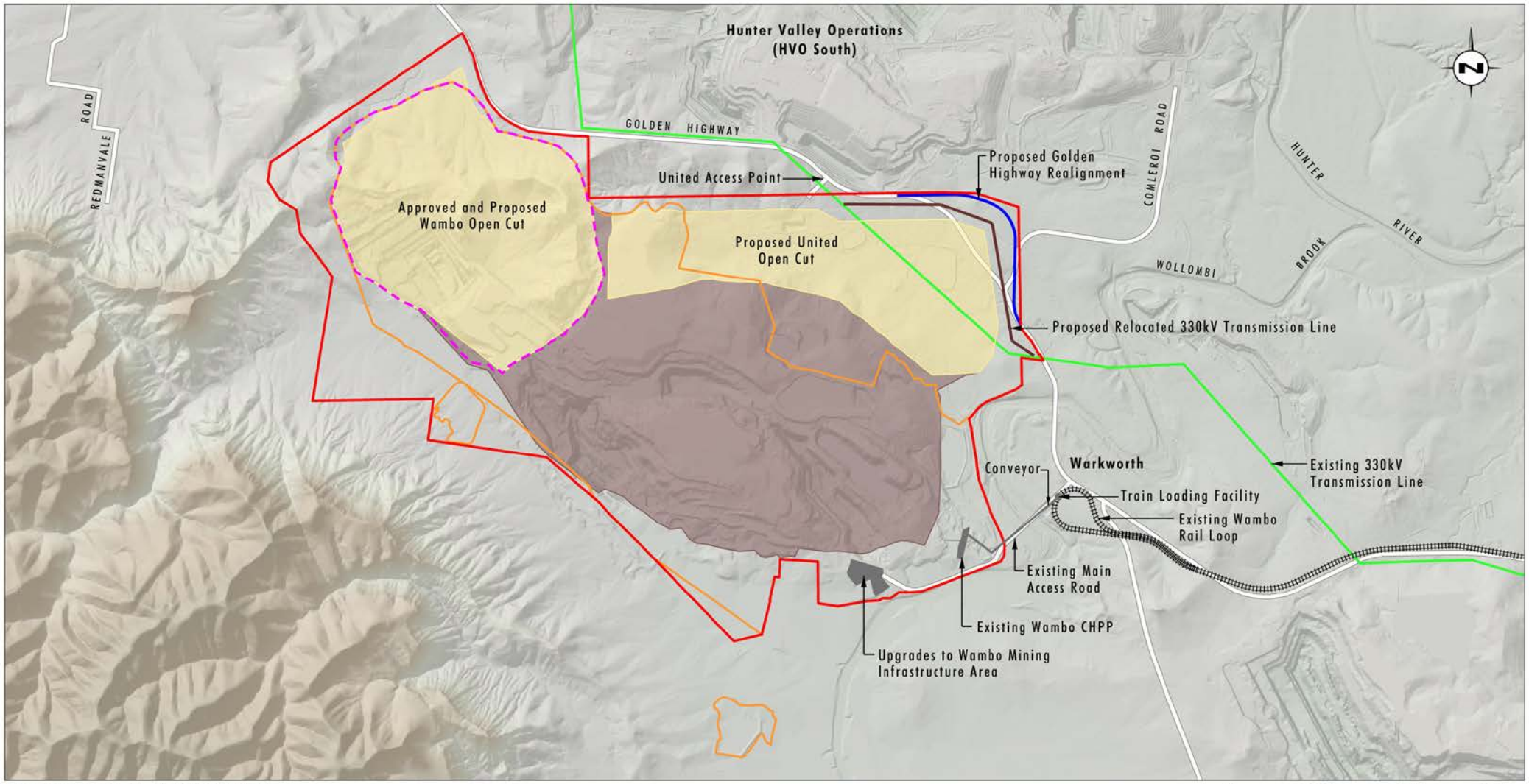


Figure 3: *United Wambo Coal Mine Project, Source: Umwelt*

FIGURE 1.5

Overview of The Project

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In terms of amenity impacts, the Department notes that the project would be expected to result in perceivable increases in noise levels and increases in air quality impacts at a number of receivers, relative to currently approved Wambo operations. As a consequence, the Department identified private receivers that should be afforded voluntary acquisition rights and those that should be afforded mitigation rights, should the project be approved. Notwithstanding, the Department considers that the project's air quality and noise impacts could be managed and regulated through appropriate conditions of consent.

The Department acknowledges that the applicant still needs to obtain a number of residual biodiversity offset credits, however it also states that the quantum of the proposed biodiversity offset package and rehabilitation works would adequately compensate for the project's biodiversity impacts. The Department considers that in the medium to long term, the proposed biodiversity offset package and rehabilitation works would lead to an overall improvement in the extent and connectivity of woodland communities.

In terms of groundwater and surface water take, the Department is satisfied that the project, during and after mining operations, would not result in any material environmental consequences for water quality, or on downstream users or receiving environments, relative to existing approved operations.

The Department also assessed the social and economic impacts of the project at the local, regional and state level and is satisfied that the management, mitigation and offset measures would appropriately minimise and address any residual negative effects of the project.

On balance, the Department considered that the proposed mine plan, management measures and final landform outcomes would strike an appropriate balance between protecting the environment and local communities and realising the economic benefits of the project. The Department's preliminary finding is that the project is likely to be approvable, subject to conditions.

4. COMMISSION'S MEETINGS AND SITE INSPECTION

As part of its review, the Commission met with the Department, the applicant and conducted an inspection of the site and surrounding locality. The notes from each of these meetings are provided in **Appendix 4**.

4.1 Briefing from the Department

On 24 January 2018, the Department briefed the Commission on the project and the content of the PAR. Specifically, the briefing included:

- an overview of the project and the key assessment matters;
- mine design, sequencing and resource;
- mining leases and Environmental Protection Licenses (EPLs);
- environmental management under the joint venture arrangement; and
- key assessment issues, which include biodiversity, groundwater, heritage (indigenous and non-indigenous), air quality, noise, airblast overpressure, property (mitigation and acquisition), final landform and rehabilitation, and economics.

4.2 Briefing from the Applicant and Site Inspection

On 7 February 2018, the Commission met with the applicant at the United mine site. The applicant briefed the Commission on existing operations, the proposal, impact assessment and mitigation, and the proposed joint venture partnership. The briefing was followed by an inspection of the locality

including the Golden Highway, the Montrose Property, Redmanvale Road, Warkworth Village, the United site, the Wambo site and the South Wambo area.

4.3 Meeting with Singleton Council

On 8 February 2018, the Commission met with Singleton Council (Council). Council briefed the Commission on the project, including its negotiations with the applicant on the voluntary planning agreement (VPA), noise, air quality and dust impacts of the project, and the long-term strategic outcomes for the region in relation to rehabilitation and potential future land uses on decommissioned mine sites.

Council raised specific and detailed concern regarding the long-term strategic land use outcomes for the Hunter region post-mining. Given the extent of mining operations in the region, Council noted the strategic land use challenge and the long-term consequences of mining in terms of final voids and offset sites sterilising land in perpetuity. The Council considers that there is an absence of government policy in relation to long-term strategic land use outcomes for the region.

4.4 Inspection of the Locality

The Commission received a number of requests from surrounding landowners to meet privately on their properties to discuss the project, and its impacts. Due to logistical and timing constraints, the Commission declined those invitations. These landowners had an opportunity to discuss the project's impacts at the public hearing. On 5 and 6 February 2018, the Commission inspected a number of locations in the surrounding locality, including Bulga, Jerrys Plains and Warkworth, to further its understanding of the lOcality. These inspections were conducted by the Commission without a representative of the applicant or the Department.

5. PUBLIC HEARING

As required by the Minister's Terms of Reference, a public hearing was held on 8 February 2018 at the Singleton Civic Centre. A total of 10 individuals and groups registered to speak at the hearing. A list of speakers that presented to the Commission is provided in **Appendix 2**. A summary of the project specific issues raised at the public hearing are provided in **Appendix 3.**

6. COMMENTS AND FINDINGS

The Commission received written submissions from the public and heard concerns at the public hearing, regarding the following issues:

- noise, vibration and blasting impacts;
- air quality – assessment criteria, meteorological conditions, potential health issues, current exceedances;
- historical and proposed monitoring and compliance in and around the project area;
- mechanics of the implementation of the joint venture, including the management of the proposed transition to Glencore as the manager of the project;
- biodiversity – impacts of clearing, adequacy of biodiversity offsets, impacts to fauna and connectivity, and use of rehabilitated land toward ecosystem credits;
- final landform and rehabilitation – final voids and long-term land use outcomes;
- water resources – impacts to surface water quality and groundwater, consideration of private and mine owned bores, and application of relevant policy and guidelines;
- property – loss of property value and visual amenity impacts;
- cumulative impacts – inadequate consideration of cumulative impacts;

- economic and social – overstated economic benefit and benefits of employment and mining companies supporting the local community, understated economic impacts on the local community, and social amenity impacts; and
- Ecologically Sustainable Development including intergenerational equity and greenhouse gas emissions.

A more detailed summary of submissions is provided in **Appendix 3**.

The Commission considered the PAR, the applicant's Environmental Impact Statement (EIS) and associated specialist reports, including the air quality and economics peer reviews. The Commission considered all public submissions and presentations made at the public hearing.

The Commission has considered the objects of the EP&A Act in its review of the project and has given application to the principles of these during its consideration of the project. The Commission notes that the Department has also considered and assessed the project against the EP&A Act within the PAR.

As part of the review process the Commission has considered a range of issues, which are discussed in greater detail below. The Commission's findings represent its preliminary views at this stage of the assessment process. The Commission notes that its views may change on any determination decision, including because of the provision of additional information in response to this review, information provided to the Commission independently of this review, additional matters raised in undertaking its final assessment of the project, or other relevant factors.

6.1 Noise, Vibration and Blasting

6.1.1 Introduction

The EIS was accompanied by a Noise Impact Assessment (NIA) prepared by Umwelt (Australia) Pty Ltd (Umwelt), which considered operational noise, cumulative noise, sleep disturbance, low frequency noise, construction noise, traffic and rail noise, and the proposed noise management and monitoring framework. The NIA was prepared in accordance with the then current *NSW Industrial Noise Policy* (INP), however it also considered the Environmental Protection Authority's (EPA's) draft *Industrial Noise Guideline* (ING). On 27 October 2017, the EPA released the final *Noise Policy for Industry* 2017 (NPI), which replaces the INP as the relevant NSW Government policy for the management and control of industrial noises.

As the project predates the release of the NPI, the transitional arrangements specify that the INP can continue to apply, apart from those aspects of the NPI that relate to low frequency noise, which have been incorporated into the project assessment.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendation is made that will require further information and/or assessment:

R1 The Commission finds that the assessment of noise impacts would benefit from the adoption of the NPI in all components of the noise assessment as it has done for low frequency noise. The applicant and the Department should consider the opportunity to adopt the NPI in all components of the noise assessment as this would allow for

the project to be assessed and considered under guidelines that represent current best practice.

6.1.2 Background Noise Levels and Project Specific Noise Levels

In establishing background noise levels for privately owned land, the NIA identified private receivers at seven geographical locations at varying distances from the project. The properties identified, and their approximate distances from the edge of proposed extraction areas include:

- one private residence in Warkworth Village (1 km east);
- 32 private residences in Redmanvale and Moses Crossing (2.0-5.5 km northwest);
- three private residences in South Wambo (3.5-4.5 km south);
- properties in Jerrys Plains (5.0-6.0 km northeast); and
- Bulga (4.5-7.0 km south).

The PAR indicates that while most of the identified receiver locations currently experience a degree of noise impact associated with existing mining operations, the influence of existing mining operations on noise levels is most evident in Maison Dieu and Warkworth Village. Receivers in the Jerrys Plains, Redmanvale, Moses Crossing and South Wambo areas are slightly more sheltered from noise impacts from existing operations due to intervening topography. The Golden Highway provides an additional source of noise, particularly evident in the evening periods.

To determine the significance of predicted noise impacts generated by the project, the applicant developed operational Project Specific Noise Limits (PSNLs), derived from monitoring data obtained from surrounding monitoring sites and attended monitoring surveys. The noise modelling for the project sought to establish the worst-case impacts expected to occur at each receiver location and applied a range of adjustment factors to account for other industrial noise sources in the area and relevant aspects of the ING.

The EIS provided two sets of noise monitoring data for Moses Creek and Redmanvale. The applicant selected the higher reading as its baseline, citing their longer duration of recording data at that location. The Department confirmed that having reviewed the monitoring data provided, it considered that the PSNLs for residential receivers required further refinement, to more accurately reflect the unique characteristics of the noise environment, including the presence of elevated background levels during the evening and night-time periods, therefore establishing a more conservative baseline.

In its assessment, the Department applied the INP's allowance provisions, setting the maximum evening and night-time rated background levels (RBLs) up to 3 decibels (dB(A)) and 1 dB(A) respectively above the measured daytime noise levels. The Department states that this approach is consistent with established practice and the community's expectation that daytime noise criteria are set higher than the evening, and evening are set higher than night periods.

Accordingly, the Department identified a range of intrusive criteria for noise impacts, including operational PSNLs and noise levels for both sleep disturbance and construction activities (see **Table 1**).

Figure 4 identifies sensitive receiver locations and land ownership surrounding the site. The figure was provided to the Commission on 28 February 2018 with updates identifying recent land acquisitions and secured offset sites.

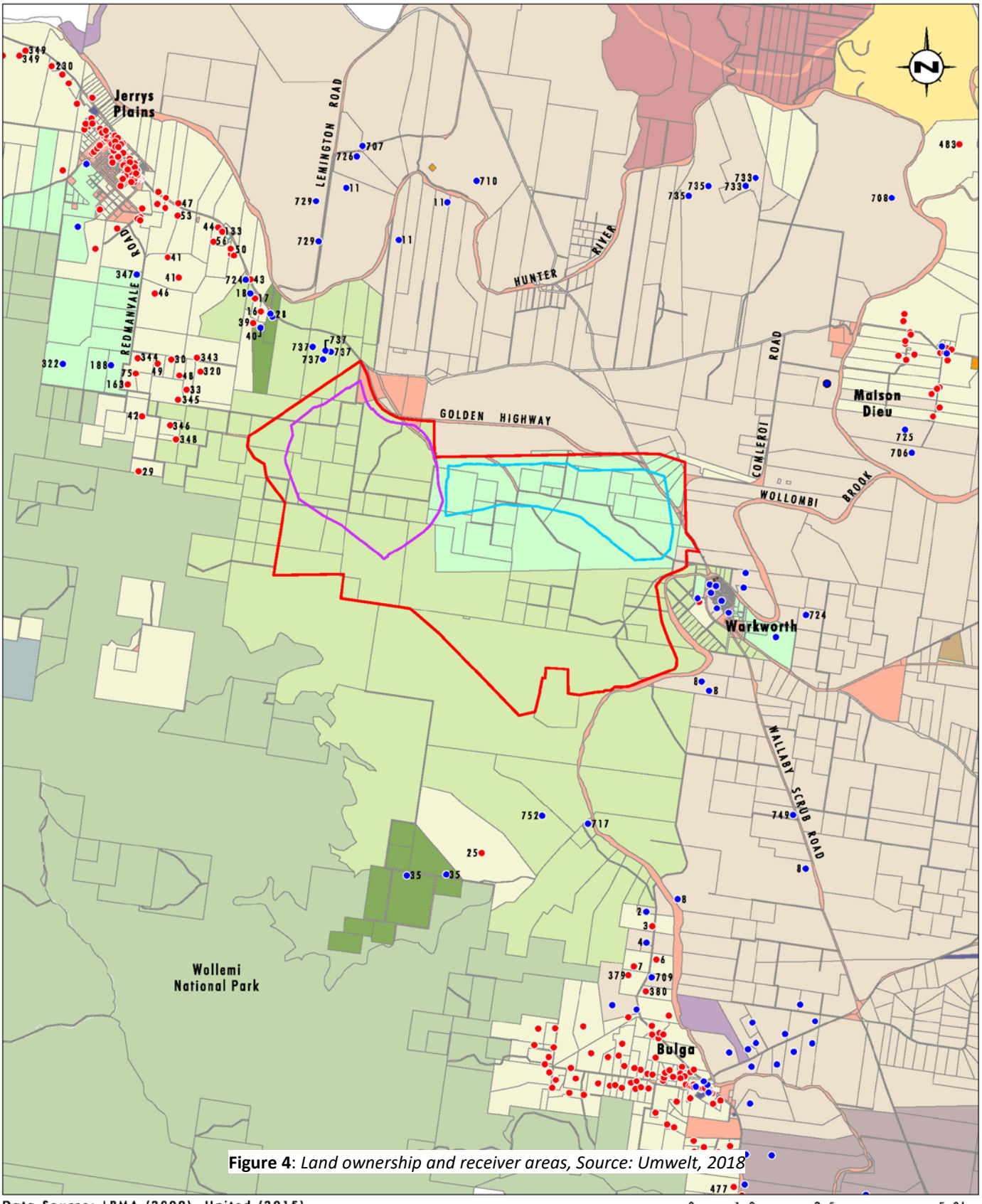

Figure 4: *Land ownership and receiver areas, Source: Umwelt, 2018*

Data Source: LPMA (2009), United (2015)

0 1.0 2.5 5.0km
1:100 000

Legend

- Project Area
- Proposed Conceptual United Open Cut Pit
- Proposed Conceptual Wambo Open Cut Realignment
- Mine Owned (Ashton)
- Mine Owned (Bulga)
- Mine Owned (Coal and Allied)
- Mine Owned (Glencore)
- Mine Owned (Integra)
- Mine Owned (Ravensworth)
- Mine Owned (Wambo)
- Mine Owned (United Wambo JV)
- AGL Energy
- Ausgrid
- Bulga Community Centre
- Government Authority (Federal, State or Local)
- Department of Education and Communities
- Diocese of Newcastle
- National Parks and Wildlife Service
- Private
- Redbank Energy
- Singleton Council
- Telstra
- Wanaruah Local Aboriginal Land Council
- Private Residence
- Mine Owned Residence

Land Ownership

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Receiver locations	Measured RBLs (LAeq, 15min) (day/evening/night)	Adopted RBLs (LAeq, 15min) (day/evening/night)	Adjusted PSNLs (LAeq, 16min) (day/evening/night)	Sleep Disturbance Criteria (LA1,1min) (night only)
Area 1 – South Wambo	27 / 28 / 27	30 /30 / 30	35 / 35 / 35	45
Area 2 - North Bulga	27 / 29 / 28	30 / 30 / 30	35 / 35 / 35	45
Area 3 – Warkworth Village	39 / 39 / 38	39 / 39 / 38	44 / 44 / 43	53
Area 4 – Maison Dieu	37 / 37 / 36	37 / 37 / 36	42 / 42 / 41	51
Area 5 – Moses Crossing	35 / 30 / 29	35 / 30 / 30	40 / 35 / 35	45
Area 6 - Redmanvale	28 / 28 / 27	30 / 30 / 30	35 / 35 / 35	45
Area 7 – Jerrys Plains	34 / 35 / 31	34 / 35 / 31	40 / 40 / 36	46
Construction Noise Management Levels			+5 / +0 / +0	+0

Table 1: *Assessed noise criteria*

The Department notes that it is confident, based on the adopted RBLs, and consideration of recent guidelines and policies, that the adjusted PSNLs provide for a conservative assessment of noise impacts, consistent with the INP and aligned with the aims of the NPI. It also considers that following the transfer of operational responsibility for open cut mining to the joint venture, the modified consents for the Wambo CHPP, rail and underground operations should be required to meet the project PSNLs, which are lower than the existing Wambo consent.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendations have been made that will require further information and/or assessment:

R2 The Department should adopt their suggested PSNLs in any conditions of consent.

R3 The applicant and the Department should demonstrate that the modified consents for the Wambo CHPP, rail and underground operations can achieve the PSNLs adopted by the Department in its assessment of this project.

6.1.3 Construction Noise

The project is predicted to generate short-term elevated levels of construction noise associated with the realignment of the Golden Highway and adjacent transmission lines, and alterations to mine infrastructure. However, given the short-term nature of these construction activities and considering that the project is not predicted to give rise to significant construction noise impacts, the applicant has proposed to meet PSNLs during non-standard construction hours.

The Department considers the applicant's proposed approach to managing construction noise would be appropriate given the short duration and nature of the activities. The Department's standard approach to managing short-term construction activities would also provide an appropriate management framework.

6.1.4 Operational Noise

Mining Operations

The NIA identified that the closest receivers would experience an incremental increase in noise as a result of the project. The PAR indicates that receivers in Moses Crossing, Redmanvale, South Wambo and Warkworth Village would experience the greatest incremental change in noise impacts. Receivers in North Bulga are predicted to experience some increase, and more distant receivers in Maison Dieu and Jerrys Plains are predicted to experience limited or reduced impacts.

The PAR indicates that the project is predicted to exceed PSNLs at 37 privately-owned residences, including:

- negligible exceedances up to 2 dB(A) at 6 residences in North Bulga, South Wambo and Redmanvale;
- moderate exceedances between 3-5 dB(A) at 22 residences in North Bulga, south and southwest of Jerrys Plains, and Maison Dieu; and
- significant exceedances in excess of 5 dB(A) at nine residences in Redmanvale, south of Jerrys Plains and Warkworth.

Figure 5 identifies the residences that are privately owned and those that are mine-owned. All properties within Warkworth, with the exception of receiver 19, are mine-owned properties and are therefore not subject to relevant noise criteria.

In addition, receiver 19 is predicted to exceed the acceptable cumulative noise criteria, set out in the INP (with exceedances of in excess of 5 dB(A)). Receiver 19 is also predicted to exceed the sleep disturbance criteria, with noise levels up to 56 dB(A) during the day and 54 dB(A) during the night, under worst case meteorological data. The Department notes that these exceedances are predicted to occur during the early stages of mining at the United site and considers that the impacts could be appropriately managed through relevant conditions.

The NIA also included an assessment of low frequency noise that aligns with the NPI assessment methodology. The NIA indicates that the project would not cause excessive levels of tonality or low frequency noise at nearby residences.

The PAR notes that six private receivers already experience noise impacts above the PSNLs from the existing Wambo project.

Road and Rail Noise

In addition, the NIA considered the contribution of noise impacts associated with operational and construction road traffic, in accordance with the *NSW Road Noise Policy* (RNP). The project would increase the construction and operational workforce, equipment fleet and associated heavy vehicle deliveries. The additional traffic would access the project site via the Golden Highway with a portion of traffic travelling along Putty Road to Singleton. The NIA considered the noise impacts associated with increased traffic volumes at six receiver locations located on the transport route in Jerrys Plains and a further three receivers at setback distances from the Golden Highway.

The assessment criteria (dB(A)) for arterial/sub-arterial roads is as follows:

- Day (7am-10pm) – LA_{eq}, 15 hour, 60 dB(A) external;
- Night (10pm-7am) – LA_{eq}, 9 hour, 55 dB(A) external.

The PAR states that the proposed increase in employee and heavy vehicle traffic is predicted to increase noise levels in the early years of the project, with predicted traffic noise impacts in Year 11 reaching 53.7 dB(A) during the 6.30am-7.30am peak period and 52.8 dB(A) during the 5.00pm-6.00pm peak period. At the nine receiver locations, the predicted noise levels during the morning peak are predicted to increase by 2.7-2.9 dB(A), relative to existing road traffic noise levels.

Afternoon traffic noise is predicted to have a short-term reduction in Year 2, however as production rates increase, the reduction is expected to progressively decline, with the Year 11 afternoon period predicted to result in only a minor reduction of 0.2-0.6 dB(A) relative to current levels.

The Department notes that the relative change to afternoon noise impacts would be undiscernible to most people, but the morning increase would be noticeable. Despite the increase in traffic volume and associated noise impacts, the project would be consistent with the criteria set out in the RNP. The PAR concludes that predicted road traffic levels would continue to comply with the RNP's objectives for arterial/sub-arterial roads at all times.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendation is made that will require further information and/or assessment:

R4 The applicant and the Department are to confirm how an increase in afternoon traffic noise is predicted to result in a reduction in noise emissions. Noting that the equivalent morning period is predicted to increase by 2.7-2.9 dB(A).

With regard to rail noise, noise impacts have been assessed from 2025 onwards as part of the harmonisation modification. There are no changes proposed to the approved annual freight throughput, operation of the existing Wambo spur, loop and train load-out facility nor would there be an increase in impact associated with rail noise at nearby receivers. The modification request seeks to increase maximum daily train movements, from six to eight trains per day, which may increase the potential frequency of rail noise impacts at individual receiver locations. Receiver 19 is the only private receiver in proximity to the rail loop, located approximately 500m to the north of it.

The NIA confirms that noise emissions from the Mt Thorley and Main Northern Rail Line are regulated via an EPL held by the Australian Rail Track Corporation (ARTC), which states: *'It is the objective of the license to progressively reduce noise levels to the goals of 65 dB(A) LAeq, daytime, 60 dB(A) LAeq, night-time and 85 dB(A) (24 hr) maximum pass-by noise, at one metre from the façade of affected residential properties through the implementation of the Pollution Reduction Programs (PRPs)'*.

The EIS states that there would be an increase of approximately 1 dB(A) in the LA_{eq} day-time and LA_{eq} night-time noise emissions from the Mt Thorley to Main Northern Rail Line spur line during the periods when up to eight trains are in use per day. The EIS notes there would be no increase in the total annual capacity, and any increase in daily movements would be offset by a decrease in daily movements at other times.

The EIS identifies that it is unlikely that rail noise associated with the project would be perceptible at current residential setback distances along the rail corridor and when considered alongside forecast rail tonnages, would not be expected to increase rail noise by more than 0.5 dB(A) on the State rail network. On this basis, the PAR concludes that the project is not predicted to increase rail by-pass noise impacts and is not proposing changes to existing noise limits contained in the ARTC's EPL applicable to DA 177-8-2004.

With the adoption of appropriate management measures and train scheduling, these limits can continue to be complied with. The Department is therefore satisfied that the loading of trains and operation of the rail loop could continue to meet the relevant PSNLs.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. At this point in time the Commission is not satisfied with the information provided and the following recommendation is made that will require further information and/or assessment:

R5 The applicant and the Department are to confirm total required rail movements for the proposed joint venture and for the ongoing Wambo underground operations. The final assessment must include consideration of any cumulative rail generated noise impacts from the Wambo rail spur.

6.1.5 Voluntary Land Acquisition and Mitigation Policy (VLAMP)

The Department's assessment considered the NSW Government's VLAMP. The VLAMP affords voluntary receiver based mitigation and property acquisition rights to noise affected property owners.

The level of exceedance, affected receivers and entitlement to mitigation and/or acquisition under the VLAMP is identified in **Table 2**.

Project Exceedance level (above PSNLs)	**Receivers**	**Entitlement under VLAMP**
Up to 2 dB(A) exceedance	6, 7, 35a, 41a, 46, 379	Negligible exceedance
3-5 dB(A)	3, 25, 29, 30, 33, 41b, 42, 44, 48, 49, 50a, 50b, 56, 75, 133, 163, 320, 343, 344, 345, 346, 348	Entitled to voluntary mitigation rights
5 dB(A) and over*	16, 17, 19**, 28a, 28b, 39, 40, 43, 50c	Entitled to voluntary mitigation and acquisition rights
Separate Wambo operations		
Up to 2 dB(A) exceedance	7, 379, 35a	Negligible exceedance
3-4 dB(A)	3, 25	Entitled to voluntary mitigation rights
16 dB(A)	19	Entitled to voluntary mitigation and acquisition rights

*includes cumulative amenity criteria exceedances, under the INP
**receiver 19 has acquisition rights under other existing consents

Table 2: *Summary of exceedances, receiver and mitigation entitlements*

The VLAMP indicates that negligible exceedances would not be discernible to the average listener and do not result in receiver-based mitigation. Exceedances between 3-5 dB(A) trigger the requirement for voluntary mitigation rights, including installation of appropriate receiver-based noise mitigation measures. Significant exceedances over 5 dB(A) trigger voluntary acquisition rights.

The Commission sought clarification from the applicant as to the properties that are entitled to mitigation, those entitled to acquisition rights and properties that are already mine-owned. The applicant provided the Commission with **Figure 5**, which identifies properties within the noise affectation zone and therefore entitled to voluntary acquisition rights, properties within the active noise management zone and therefore entitled to voluntary mitigation treatment, vacant land, private land and mine owned land. The figure focusses geographically on the area northwest of the project site. Mine owned and privately-owned land in the areas surrounding the site are shown on **Figure 4**.

United Wambo Project

Redmondvale Road and Moses Crossing Residences

GLENCORE

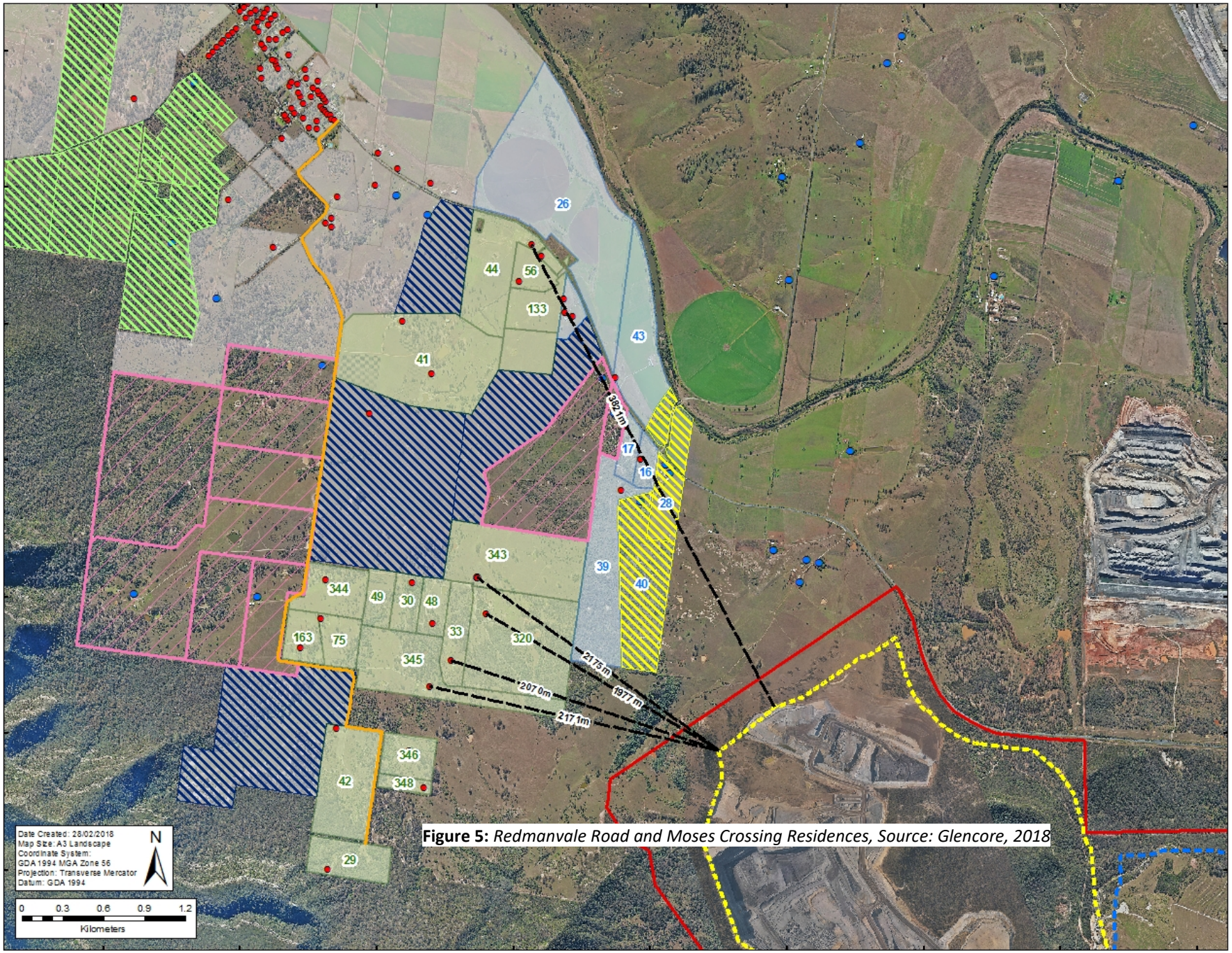

Figure 5: *Redmanvale Road and Moses Crossing Residences, Source: Glencore, 2018*

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The Commission heard specific concerns regarding the accuracy of noise contours for the project, the location of certain residences in relation to the noise contours in determining the level of noise affectation, and the subsequent application of the VLAMP.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is generally satisfied with the noise assessment, it is not satisfied with the level of detail of the information provided regarding the application of the VLAMP. The following recommendations are made that will require further information and/or assessment:

R6 The applicant must provide to the Department a revised noise contour map that utilises 1 dB(A) noise contours.

R7 Based on the revised noise contour mapping, the applicant and the Department must clarify noise impact affectation at sensitive receiver locations. Subject to the outcome of this mapping, the Department should re-assess the application of the VLAMP.

R8 The applicant shall provide a breakdown of all acquisition rights and mitigation rights for all properties within 3km of the project boundary and the consents under which they are entitled to these rights.

R9 The applicant and the Department should ensure that any updated noise assessment accurately reflects current land ownership.

6.1.6 Cumulative Noise

The NIA included two modelled approaches to assess the potential cumulative noise impacts in combination with other industrial noise sources, including Hunter Valley Operations South (HVO S), Mt Thorley Warkworth, Rix's Creek and road traffic noise associated with the Golden Highway. The assessments indicate that cumulative noise levels are predicted to comply with the INP's acceptable night-time rural amenity criteria of 40 dB(A) for all residences in South Wambo, Redmanvale and Jerrys Plains.

The PAR indicates that the project would contribute to cumulative amenity impacts in nearby locations (North Bulga, 10% project contribution, Maison Dieu, 30% project contribution and Moses Crossing, 40% project contribution), in the range of 41-42 dB(A) at night, which represents a negligible exceedance of the acceptable amenity criteria in these areas. The Department states that exceedances of this magnitude would not be discernible to the average listener and under the VLAMP, no further mitigation or acquisition rights are required for these impacts.

6.1.7 Operational Noise Management

The applicant's EIS states that reasonable and feasible noise controls have been considered throughout the project design process and incorporated into the project's noise modelling, reducing the extent of noise affectation. The EIS states that a combination of proactive and reactive/adaptive controls would be required to be implemented over the life of the project, including:

- incorporation of reasonable and feasible noise attenuation on key items of plant and equipment that will be re-used from the current Wambo Open Cut operations or other controls achieving the same overall noise outcome;
- reasonable and feasible noise attenuation measures on new plant and equipment that has the potential to contribute to the project's noise level;

- using ‘silent horns’ to communicate with trucks and smart broadband ‘Quacker' reversing alarms;
- the inclusion of bunds at strategic locations along haul roads, where practicable, to shield trucks and equipment on exposed sections of the haul road ramps;
- locating key haul roads below ground surface level or topographical features to maximise shielding to surrounding receiver areas, where practicable;
- designing emplacement areas to create sheltered dumping locations that can be used during adverse weather conditions, where feasible and practicable; and
- managing the drop height of the first load into truck bodies to minimise impact noise from the loading of material.

In addition to these measures, the applicant has committed to implement operational controls, which would vary during different mine stages and weather conditions. Several controls and strategies have been incorporated in the noise model, including:

- strategic relocation or shut down of acoustically significant equipment during adverse meteorological conditions that could result in noise propagation towards sensitive receivers;
- limiting the activities of ancillary equipment in exposed locations; and
- progressive shut down of equipment in elevated locations.

The EIS presents a number of other general noise mitigation measures, including regular inspection and maintenance of attenuation systems, periodic review of the noise performance of equipment, implementation of systems to identify adverse meteorological conditions, noise awareness training for key employees and the offering of reasonable and feasible noise mitigation.

The Department’s assessment notes that several aspects of the project involve ongoing interactions with the existing Wambo site, such as with the CHPP, rail loop, use of shared haul roads and the like. The EPA raised significant concerns regarding differentiation of noise sources and the need to develop a methodology to accurately determine the source of noise emissions arising from the project, as distinct from separate and ongoing Wambo operations, in order to assess noise compliance and identify sources of exceedances.

In response to the EPA’s concerns, the applicant developed an assessment and compliance protocol. The protocol relies on the use of attended monitoring to supplement the proposed continuous monitoring network to determine the relative impacts of the project in each receiver area. The proposed attended monitoring would measure the timing and duration of audible noise sources that contribute to the maximum recorded noise level.

The EPA was generally satisfied with the proposed approach, however it requested that the applicant provide a system that would identify the status of relevant equipment fleet that would allow the EPA to undertake independent monitoring for regulatory purposes. The applicant confirmed the equipment is GPS tracked every six seconds and records can confirm the status of equipment fleet operating at any given time. Both the EPA and the Department are satisfied with the proposed compliance protocol and that it provides for the accurate assessment of each site’s respective noise emissions.

In addition, the applicant has committed to implement a comprehensive noise monitoring program to determine the contribution of the project to cumulative noise levels in the region and guide the management of noise emission sources on site. The Department is satisfied that this represents a reasonable and feasible approach. The Commission also agrees with this approach.

6.1.8 Blasting and Vibration

The EIS was accompanied by a Blast Impact Assessment (BIA), which included ground vibration and airblast modelling to consider potential impacts on surrounding receivers, infrastructure, historic buildings and structures, interactions with other nearby mining operations, and potential impacts from flyrock.

The applicant proposes to extract coal through drill and blast mining methods, which would continue in the same manner to the existing Wambo open cut operations. These activities currently occur between 9am and 5pm Monday to Saturday, with a maximum of 15 blasts per week, limited to three per day with allowances for low vibration blasts and any misfires.

The BIA sets out blast emission criteria for human comfort, adopting the Australian and New Zealand Environmental Conservation Council (ANZECC) Guidelines, which provide the technical basis and guidance for minimising annoyance associated with blasting, airblast overpressure and ground vibrations. **Table 3** sets out the residential blast impact criteria.

Receiver	**Peak Particle Velocity (mm/s)**	**Allowable exceedance**	**Overpressure (dBL)**	**Allowable exceedance**
Residence on privately owned land	5	5 per cent of the total number of blasts over a 12 month period	115	5 per cent of the total number of blasts over a 12 month period
	10	0 per cent	120	0 per cent

Table 3: *Residential blast impact criteria*

The ANZECC guidelines provide that airblast overpressure levels should be managed to below 115 decibels (in peak) where possible, allowing for a 5% exceedance of general criterion. The guidelines also state that airblast overpressure impacts may exceed 115 decibels for up to 5% of blasts over a 12-month period, with a maximum recommended level of 120 decibels.

The BIA finds that the impacts of vibration as a result of blasting would be highly variable, dependent upon the charge mass. Low charge masses would have a negligible impact. The estimated vibration exposure for all private residences, with the exception of receiver 19, using variable charge masses up to 1,236 kg is predicted to be no higher than 0.6 mm/s. The highest value of exposure is considered to be low/negligible, which is below the applicable vibration limits specified as 5 mm/s (for 95% of blasts) and 10 mm/s (not to be exceeded).

The modelling identified that at a distance of 1,070m receiver 19 could experience a potential vibration exposure could be in the order of 0.5 to 6.1 mm/s. The BIA predicts that by managing charge mass, the ground vibration impact could be managed for 95% of blasts, to meet the relevant criteria. The applicant, however, has indicated that it is not operationally feasible to manage blasting to avoid this exceedance. The modelling identifies that for the maximum charge mass (1,236kg) compliance would be achieved when blasting at a distance of 1,220m from the residence.

The applicant has advised that exceedances from blasting would be subject to a negotiated agreement. At this point in time it not clear to the Commission how the negotiated agreement process operates or what rights and obligations a standard agreement establishes for the mine operator and the resident.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendation is made that will require further information and/or assessment:

R10 The applicant is requested to provide details of the negotiated agreement process and the form of the standard agreement in relation to blast exceedance affected residences to allow consideration of its effectiveness as a mitigation measure.

Potential blast noise exceedances are predicted at receivers 28, 39 and 40. The BIA confirms that under a worst-case scenario, these receivers could exceed predicted airblast overpressures by up to 1 decibel. The applicant notes that these exceedances could be managed by lowering the charge mass when blasting in proximity to some residences. The applicant recently purchased receiver 28 and receivers 39 and 40 would be afforded voluntary acquisition rights based on their location within the noise affectation zone.

In addition, the proposed project is predicted to have a similar level of impact as current ongoing operations at the Wambo site. The Department also confirmed that Wambo has been able to manage its blast impacts to remain compliant with existing conditions of consent.

The Department identifies a number of measures that could be imposed to manage potential impacts of blasting on residential receivers, infrastructure, and historic buildings and structures, including:

- blasting to not occur simultaneously in both pits;
- standard blast criteria must be met at all private residences, unless an agreement has been reached with the relevant landowner and the applicant has advised the Department in writing of the terms of this agreement;
- install an additional monitor in the northeast of the Wambo site, in the vicinity of receivers in this area (485, 495 or 496) to supplement the current multi-station monitoring system to ensure adequate monitoring of vibration from future blasting;
- worst case blasting predictions should be reduced as far as practicable through blast design;
- establish a process to manage blast design as part of the Blast Management Plan; and
- Blast Management Plan must include the measures set out in the applicant's EIS), including managing the potential risk of flyrock and cumulative blast impacts.

The Commission notes the applicant's commitment to complete a condition assessment of all historical sites proposed to be retained, sites that have not been subject to archival recording and private residences. A condition assessment of historical sites and property inspections would be undertaken for sites within 2 km of the project extraction areas, prior to the commencement of blasting.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with the BIA, it is not satisfied with the information provided in relation to the management of potential blast exceedances. The following recommendations are made that will require further information and/or assessment:

R11 The applicant must provide details demonstrating how it will avoid exceeding blast criterion (receiver 19 excluded). The Department should consider how such details could be included in a statement of commitments or a condition of consent.

R12 The applicant should propose appropriate conditions and/or commitments to the Department to undertake regular condition inspections of buildings within 2 km of project extraction areas.

6.2 Air Quality

The EIS was accompanied by an Air Quality Impact Assessment (AQIA) prepared by Jacobs Group (Australia) Pty Ltd. The AQIA assessed the potential air quality emissions generated by the project over a range of representative years and mining stages. The AQIA considered 24-hour, monthly and annual average air quality criteria for dust deposition, total suspended particulates (TSP), fine particulate matter (PM_{10} and $PM_{2.5}$) and blast fumes in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (December 2005). The AQIA also considered management and monitoring measures.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendation is made that will require further information and/or assessment:

R13 The applicant and the Department should consider the current NEPM and EPA's Approved Methods 2016 in its AQIA and give consideration to the adoption of these updated guidelines for the project.

6.2.1 Peer Review

The Department commissioned Ramboll to undertake an independent peer review of the applicant's AQIA. The Ramboll review, completed in September 2016, identified several uncertainties that required further consideration, along with issues relating to air quality methodology and impact assessment. The Department considered the recommendations of the Ramboll review and requested that the applicant provide a detailed response as part of its RtS.

In January 2017, Coal & Allied (now Yancoal) submitted an application to modify the neighbouring HVO South Mod 5, to enable increased production rates and production flexibility for the mine complex to meet market demand. Whilst the applicant's AQIA considered conceptual plans for HVO South Mod 5, the Department identified a range of inconsistencies in predicted cumulative air quality impacts between the two proposals. The Department subsequently commissioned Ramboll to undertake a further coordinated expert review of the AQIAs for both proposals. The review focussed on the worst-case predicted cumulative impacts to inform a proper assessment of impacts on the community. The Department notes that this was necessary in order to inform consideration of landowner rights under the VLAMP.

The Ramboll review confirmed the presence of notable differences in predicted cumulative annual average PM_{10} concentrations between the two assessments, stating that the input emissions inventories adopted for different mining operations in the region as the likely reason for the difference. The review also noted differences in the approaches taken to calculate background datasets for non-modelled mining sources and differences in the local meteorological datasets used in each assessment.

Ramboll acknowledged the merits of both assessment approaches, however recommended that the air quality consultants agree to a consistent approach. In July 2017, the Department subsequently requested that the applicant and Yancoal address the inconsistencies and prepare a coordinated

assessment of the air quality impacts of both proposals utilising consistent modelling inputs and jointly validated outputs. The Department requested that the coordinated assessment be undertaken in accordance with the contemporary methods and standards contained in the updated version of the EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants 2016* (Approved Methods 2016).

In September 2017, the applicant and Yancoal provided a joint response to address the recommendations of the Ramboll review, focussing on a joint cumulative assessment for annual average PM_{10} and $PM_{2.5}$ emissions, as the two criteria had the highest probability of impacts for residential receivers. Having reviewed the revised modelling, Ramboll advised that all the technical issues had been adequately addressed and that the revised modelling provided sufficient certainty to determine the PM_{10} and $PM_{2.5}$ impacts of both proposals. The Department is subsequently satisfied that the residual issues have been addressed.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendations are made that will require further information and/or assessment:

R14 The applicant must fully revise and update its AQIA incorporating the additional modelling undertaken in response to the Ramboll review.

R15 The Department should confirm that the recommendations of the Ramboll review have been fully considered and, where appropriate, adopted by the project or secured through conditions of consent.

6.2.2 Existing Air Quality Environment

The existing air quality environment around the project is influenced by topographic features and existing land use activities such as mining and agriculture. The project borders the cliff-lines of the Wollemi National Park and other natural ridgelines that provide varying degrees of attenuation for dust impacts. A northwest and southeast wind axis runs between Jerrys Plains and Warkworth Village, influencing air quality dispersion patterns.

The Department notes the extent of monitoring data available for the area, including:

- high volume air samplers (HVAS);
- tapered element oscillating microbalance instruments (TEOMs);
- dust deposition gauges; and
- Office of Environment and Heritage's (OEH's) Upper Hunter Air Quality Monitoring Network.

The applicant's response to the Ramboll review identified existing annual average PM_{10} background levels in the area up to 19.2µg/m³, with daily levels approaching and on occasion exceeding the 24-hour PM_{10} assessment criterion of 50µg/m³ at mine-owned and private residences, particularly during drier months. The Department notes that the existing Wambo mine has generally complied with the limits, partly due to ridgelines that provide a buffer between mining operations and residential properties and the existing pro-active and reactive management measures.

6.2.3 Air Quality Impacts

The likely air quality emissions associated with the project reflect a continuation of the existing Wambo open cut operations, with some incremental intensification of operations associated with an

increase in equipment fleet, the extraction of coal and placement of overburden from two active mining areas.

The applicant's AQIA reflects the general shift in the emissions envelope of the project, including:

- sustained impacts from the Wambo pit to the northwest associated with the 20-year extension to mining operations and the new United pit; and
- operation of additional haul roads, dumping activities and increased CHPP throughout in the southeast of the project site, which would lessen over time as mining progresses to the northwest away from Warkworth Village.

The Department acknowledged submissions made by NSW Health and the public regarding recent variations to the environmental assessment advisory standards set out in the National Ambient Air Quality National Environment Protection Measures (NEPM) and the EPA's Approved Methods 2016. The Department confirms that the project predates gazettal of the updated NEPM and EPA's Approved Methods 2016 and therefore the project must be assessed against the air quality modelling and assessment criteria established in the Approved Methods 2005. The relevant approved methods are also reflected in the current VLAMP, which prescribes that mitigation and acquisition rights must be determined in accordance with a PM_{10} criteria of 50µg/m³ 24-hour and 30ug/m³ annual average. The VLAMP does not provide for mitigation or acquisition on the basis of $PM_{2.5}$ impacts.

In addition, the Commission heard concerns regarding the use of 2014 as the base meteorological modelled year within the AQIA, and whether the EIS should consider assessment criteria for 2025, based on the EPA's Approved Methods 2016.

With regard to the selected base modelled year of 2014, the applicant's AQIA confirmed the factors regarding the selection of 2014 data as the base year, including:

- similar wind patterns to other years;
- rainfall was slightly below the long-term average, and the preference was for a slightly drier than average year; and
- air quality conditions that showed similarities to other years and not adversely influenced by bushfire activity.

The Department considers that the modelled years in the AQIA represent the worst-case scenarios for dust generation and are therefore a conservative representation of the maximum probable 24-hour PM_{10} impacts on residential receivers over the life of the project. The PAR states that overall the project would generate elevated PM_{10} and $PM_{2.5}$ levels in the immediate vicinity of the project and an increase in the number of 24-hour periods where elevated cumulative air quality impacts would be experienced. Based on this, the Commission is satisfied with the use of 2014 as the selected modelled year.

At receiver 19 in Warkworth Village, impacts are expected to include:

- cumulative annual average PM_{10} impacts of up to 43.4µg/m³ (criterion 30µg/m³) including a contribution of 13µg/m³ associated with the project;
- 24-hour PM_{10} impacts (above the 50µg/m³ criteria) on up to 13 days in Year 6, with a maximum project-alone impact of 87µg/m³;
- cumulative total suspended particulates (TSP) of 69µg/m³ (annual average criterion 90µg/m³);
- a project contribution of 1.3g/m²/month towards cumulative deposited dust levels of 4.0g/m²/month (criterion annual max increase 2g/m²/month and annual max total 4g/m²/month);
- project alone 24-hour $PM_{2.5}$ impacts of 24µg/m³ (criterion 25µg/m³) and cumulative annual average $PM_{2.5}$ impacts of 8µg/m³ (criterion 8µg/m³).

The Department considers that these impacts are significant, however receiver 19 is already entitled to acquisition rights associated with air quality and noise impacts from existing consents and these rights would continue under the project.

Private residences in Moses Crossing are predicted to experience air quality impacts, including:

- project alone impacts up to 21µg/m³ 24-hour PM_{10} (criterion 50µg/m³);
- between 1.4-4.5µg/m³ towards the cumulative annual average PM_{10} levels of up to 21µg/m³ (criterion 30µg/m³);
- up to 5µg/m³ towards the cumulative annual TSP levels of up to 57µg/m³ (criterion 90µg/m³);
- 0.5g/m²/month towards the cumulative deposited dust levels of up to 3.0g/m²/month (criterion annual max increase 2g/m²/month and annual max total 4g/m²/month); and
- project alone 24-hour $PM_{2.5}$ impacts of 4µg/m³ (criterion 25µg/m³) and cumulative annual average $PM_{2.5}$ impacts of 5µg/m³ (criterion 8µg/m³).

At these levels, the AQIA notes that impacts are not predicted to result in any exceedances of the relevant 24-hour or annual average PM_{10}, TSP or dust deposition criteria at any private residence, or over vacant land where a dwelling could be built. The Department also notes that although the new NEPM standards do not apply, the predicted project impacts would comply with these standards for both PM_{10} and $PM_{2.5}$.

The Department confirms that it is satisfied that no properties would exceed the criterion on more than five days over the life of the project and therefore no additional acquisition rights are required.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. The Commission is satisfied with the information provided.

Blast Fumes

The AQIA considers the predicted fume impacts associated with the project's blasting. The applicant confirmed that blasting is only carried out during favourable weather conditions between 9:00am and 5:00pm. The assessment considered a worst-case comparative scenario that represents an unlikely event of an uncontrolled blast during adverse weather conditions.

The assessment identified that during adverse weather conditions, the project is not predicted to exceed the 1-hour average NO_2 assessment criterion of 246µg/m³ at nearby private residences surrounding the site. The Department notes that there is limited potential to exceed this criterion in Warkworth Village should an uncontrolled blast occur during adverse weather conditions. These predictions are associated with a worst-case scenario of an uncontrolled blast coupled with adverse weather conditions, which the applicant emphasises is a highly unlikely scenario. The maximum blast levels are predicted to exceed the 1-hour average NO_2 level of 246µg/m³ where they disperse to the north across the Golden Highway and neighbouring HVO South.

The applicant is required to close the Golden Highway during a blast event and therefore the Department is satisfied that risks to road users would be managed as a result of the closure. The EPA has indicated that any EPL for the project would require the applicant to ensure that it does not emit any offensive blast fumes that could be harmful or impact on any person outside of the site. The applicant has committed to incorporate a number measures aimed at reducing the likelihood of blast fumes approaching or exceeding the relevant criterion. Measures would be similar to those that are currently implemented under the existing Wambo Blast Management Plan.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendation is made that will require further information and/or assessment:

R16 The applicant must demonstrate how it intends to actively monitor blast fume impacts and concentrations at the project boundary to ensure compliance with relevant standards.

Diesel Emissions

The AQIA considers the emission of NO_x from diesel combustion on site and further information was provided as part of the RtS process. In response to the RtS, the EPA raised concerns with the representation of emissions from diesel engines and recommended that this be included in emissions estimates used to assess potential impacts, particularly for $PM_{2.5}$. The EPA is particularly concerned with management of off-road diesel emissions, as a component of $PM_{2.5}$ emissions and recommended that the applicant undertake further analysis of the project's diesel emissions inventories.

In response to issues raised by the EPA, the applicant provided further information around existing measures it has adopted for the management of diesel emissions across their State-wide mining operations and proposed management and mitigation measures for diesel emissions generated by the project. The EPA recommends a condition of consent requiring that new equipment commissioned by the applicant after January 2019, comply with diesel emission standards. The Applicant's Response to Request for Additional Information (September 2017) states that the project is not in a position to make a commitment to this recommended condition, but that it expects the EPA will implement a Pollution Reduction Program (PRP), which would be applicable to the project and if approved, would achieve the EPA objective.

The Department supports the EPA's objective of establishing baseline diesel combustion emissions at mine sites including identifying practicable mitigation measures and site-specific controls to reduce emissions and considers that these measures could be reflected and implemented through the project's air quality management plan or EPL.

Greenhouse Gas Emissions

The EIS was accompanied by a Greenhouse Gas and Energy Assessment (GHGEA), prepared by Umwelt.

The GHGEA estimated that the project and associated harmonisation modifications would contribute approximately 7.2 Mt of Scope 1 and 2 emissions over the life of the project. These direct emissions are primarily attributed to the operational stage where the project would generate approximately 252,000 tonnes of Scope 1 and 60,500 of Scope 2 emissions each year. The total indirect Scope 3 emissions over the life of the project would comprise approximately 259.4 Mt and would occur after product coal has been exported overseas. The Scope 3 emissions are primarily associated with downstream electricity generation.

The GHGEA considers the Commonwealth Government commitment to the Paris Agreement seeking to achieve a 25-28 per cent reduction in GHGE by 2030. The GHGEA predicts that the project's Scope 1 and 2 emissions would account for approximately 0.053 per cent of Australia's annual GHGE levels in 2030, which potentially compromises Australia from achieving its commitment under the Paris Agreement.

In its consideration of GHGE, the Department notes that it would be more greenhouse gas intensive to extract the equivalent 150 Mt from the development of a new mine or should each joint venture partner extract the same amount from two separate mine sites. The Department considers that the consolidation and intensification of mining operations on the existing mine sites enables a more efficient use of existing equipment and would achieve a lower per tonne GHGE rate than each standalone operation would.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with the AQIA and GHGE assessments, it is not satisfied with the information currently provided regarding the applicant's commitment to reduce diesel emissions on the site. The following recommendations are made that will require further information and/or assessment:

R17 The Commission recommends that the applicant and the Department demonstrate that all reasonable measures to reduce GHGE have been explored, including, but not limited to, diesel emissions.

R18 The Commission finds that deferring pollution reduction measures until such time in the future when a PRP may be implemented is not satisfactory. The Commission recommends that the applicant explore opportunities to make commitments to pollution reduction prior to any determination of the project.

R19 The Commission supports the EPA's objective of establishing baseline diesel combustion emissions at mine sites and identifying mitigation measures and site-specific controls to further reduce emissions over time. The applicant should adopt such an approach and provide relevant information demonstrating how it will continue to reduce emissions over time.

Mine-Owned Residences

The PAR states that the applicant and other mining companies own and tenant a number of residences in the area. Dust levels at 22 of these mine-owned residences currently exceed the relevant dust criteria for the project. The Department notes that there are no set dust criteria for mine-owned residences, however tenants should be informed of the potential health risks associated with elevated air quality impacts.

The applicant provided information in its RtS, in response to issues raised by Council. The applicant proposes to work with the mines that own residences in the area to provide for appropriate management of risk to tenants, including provision of information regarding dust levels in proximity to the residence and appropriate clauses within the rental leases relating to the tenant's ability to terminate the lease without penalty should dust criteria be exceeded. The Department considers that if the project were to be approved, conditions would be required to reflect these measures and applicant commitments.

The Commission requested clarification on how mine-owned residences are managed. The applicant confirmed in its briefing to the Commission that residents of Warkworth Village were informed by letter in 2017 regarding the predicted air quality impacts and were provided with the factsheet, 'Mine Dust and You'. The applicant notes that if the project is approved, it will:

- inform all tenants in mine-owned properties, provide the dust factsheet and inform tenants of predicted air quality impacts;
- work with tenants to manage impacts with relocation being a viable option, including no

penalty for early termination; and
- continue to work with other mining companies who own properties in Warkworth Village to manage potential impacts upon their tenants.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. The Commission is not satisfied with the information provided in relation to management of mine-owned residences and the following recommendation is made that will require further information and/or assessment:

R20 The Commission requests evidence of the policies and protocols in place to manage mine-owned residences, including clarification as to whether termination rights are only triggered in relation to dust exceedances, or whether termination at any time is a general at will right of occupancy of a mine owned residence.

6.2.4 Air Quality Management Measures

Currently, the Wambo mine implements a range of dust mitigation measures designed to meet the requirements of existing conditions of consent, its EPL and relevant PRPs, which aim to identify and further reduce dust emissions from the site.

The applicant's EIS sets out a number of monitoring and management measures. The applicant would also continue to implement a range of mitigation measures, including:
- use of water carts and dust suppressants on unsealed haul roads;
- restrictions on dust-generating activities during adverse meteorological conditions, such as reducing vehicle speeds, delaying blast activities, minimising vehicle access to soil stockpiles, reducing dump heights and modifying operational equipment fleet locations;
- operation of real-time dust monitoring and automatic alarm systems, to inform the mine when dust levels are approaching the relevant exceedance criteria;
- managing mining operations to minimise dust generation at the source, including through the application of water sprays, dust skirts and/or curtains and shields for relevant equipment, during drilling, at ROM hopper bins and coal stockpile areas; and
- progressive site rehabilitation, focusing on timely revegetation of disturbed landforms.

The applicant has committed to build on its existing real-time meteorological and air quality monitoring network to help forecast meteorological conditions likely to increase the generation and dispersion of emissions and to proactively alert and modify operational equipment fleet to meet relevant air quality criteria.

The Commission considers that the mine's regulatory framework requires detailed consideration and planning to ensure the transition to the joint venture is appropriately managed from an ongoing compliance management perspective.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendation is made that will require further information and/or assessment:

R21 The applicant has committed to develop its existing real-time meteorological and air quality monitoring network. The applicant is to demonstrate how it intends to achieve this and the Department should consider the implementation of this commitment by way of conditions of consent.

6.3 Biodiversity

6.3.1 Introduction

The EIS was accompanied by the *Upper Hunter Strategic Assessment Interim Policy Statement of Consistency* prepared by Umwelt, which assessed the potential ecological impacts of the project against the *Upper Hunter Strategic Assessment Interim Policy* (UHSA). The UHSA is a joint initiative of the NSW and Commonwealth Governments to improve the consideration of new or expanded coal mines that have the potential to impact on biodiversity in the Upper Hunter Valley. The UHSA involves upfront identification of:

- biodiversity values present within identified areas;
- biodiversity impacts associated with potential mining activities within these areas; and
- the development of a coordinated offsetting strategy that would be secured through the establishment of an Upper Hunter Offsets Fund (UHOF).

As a signatory and financial contributor to the preparation of the draft Biodiversity Plan underpinning the UHSA, United was eligible to have the project assessed under the UHSA framework. The assessment addressed matters raised in the Secretary's Environmental Assessment Report (SEARs) and was undertaken in accordance with Pathway 1 of the UHSA Interim Policy, whereby approval was being sought prior to the draft UHSA Biodiversity Plan and UHSA offset fund having been released for public exhibition. The assessment considers a range of historical flora and fauna studies undertaken at the Wambo and United sites since 2006, targeted surveys undertaken as part of the Biodiversity Certification Assessment Report, prepared by Umwelt in 2015, and identifies the type and condition of vegetation communities contained within the project site.

Accordingly, the applicant prepared its EIS to address the requirements of the UHSA on the basis that the draft UHSA Biodiversity Plan would be publicly exhibited and finalised prior to project determination. The Department confirmed that delays in the public exhibition of the draft UHSA meant that the process has not yet been finalised. Given this delay, and potential uncertainty for both the applicant and the community, the applicant submitted a supplementary *Biodiversity Assessment Report* (BAR), prepared by Umwelt (May 2017) in accordance with the *NSW Framework for Biodiversity Assessment* (FBA, 2014), and the *NSW Biodiversity Offsets Policy*. The BAR considered potential biodiversity impacts and offset requirements and was submitted as part of the applicant's RtS.

6.3.2 Existing Environment

The project site is located approximately 3 km north of the sandstone escarpments of the Wollemi National Park and is characterised by a landscape of ridgelines and undulating foothills that dominate the topography to the south and west.

The vegetation communities within the project site comprise stands of remnant woodland vegetation, regenerated forest and woodland communities and limited areas of derived native grassland.

6.3.3 Threatened Flora Species and Populations

The following populations have been recorded within the site and surrounds:

- endangered Scant Pomaderris (*Pomaderris Queenslandica*) (*Threatened Species Conservation Act* TSC Act);
- vulnerable Slaty Red Gum (*Eucalyptus glaucina*) (TSC Act and EPBC Act); and
- endangered River Red Gum (*Eucalyptus camaldulensis*) population in the Hunter catchment.

The applicant revised its project layout during the RtS process to avoid two known stands of endangered populations of Weeping Myall (*Acacia pendula*) in the Hunter Catchment (listed under the TSC Act). The Department supports the applicant's revised layout and considers that the active management and recovery of these stands has the potential to benefit the endangered population in the long-term.

The Department considers that there is some potential that the derived native grasslands, eucalypt forest and drainage lines within the disturbance footprint, could provide seedbanks and suitable habitat for these communities. Given a lack of historical records or identification of threatened flora during the targeted surveys, the Department recommends that pre-clearance surveys be undertaken and that any threatened species found should be propagated or translocated to appropriate proximate offset areas, and residual impacts managed under a Biodiversity Management Plan.

On 5 December 2017, the applicant submitted revised mapping of the *Central Hunter Valley Eucalypt Forest and Woodland* (CHVEFW) *Critically Endangered Ecological Community* (CEEC), in response to comments received from OEH. To inform the mapping, the applicant undertook additional fieldwork including review of HU906 – Bull Oak Grassy Woodland of the Central Hunter Valley, which found a further 43.8 ha is considered to conform with CHVEFW CEEC and that based on the revised mapping the project would result in a total impact of 250.21 ha on CHVEFW CEEC. The information submitted also confirmed that there would be no change in ecosystem credit requirements overall, remaining at a total of 26,625 over the life of the project.

OEH provided further comments on 11 December 2017, noting that it is satisfied with the revised mapping and no further work would be required on this matter.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendation is made that will require further information and/or assessment:

R22 The Commission supports the Department's position regarding pre-clearance surveys and would recommend the development of appropriate conditions of consent.

6.3.4 Extent of Project Disturbance

The total extent of project disturbance is 679 ha, which includes:

- disturbance of 532 ha of vegetation (approximately 17.5% of the total project area) and includes 250 ha of CHVEFW CEEC; and
- re-disturbance of 147 ha of partially rehabilitated non-native vegetation that has been previously cleared for mining purposes.

The total disturbance area was reduced through design refinement during the RtS process from the 714 ha that was presented in the original EIS.

In addition, the project proposes clearing of approximately 210 ha of native vegetation communities, which conforms to the definition of an endangered or vulnerable ecological community (EEC or VEC) under the TSC Act.

Groundwater Dependent Ecosystems (GDEs)

The applicant's BAR identified potential GDEs within the additional disturbance area, which comprise the following vegetation types:

- *Swamp Oak – Weeping Grass Grassy Riparian Forest*; and
- *Forest Red Gum Grassy Open Forest on Floodplains.*

Both vegetation types occur along Redbank Creek, and have patchy distribution. The applicant notes that the remaining vegetation types within the riparian zone are unlikely to be GDEs.

The BAR identified the following vegetation types that occur outside the disturbance area but in the local area and have the potential to be at least partially groundwater dependant:

- *Central Hunter Swamp Oak Forest* EEC;
- *Hunter Floodplain Red Gum Woodland Complex* EEC;
- *Hunter Valley River Oak Forest*;
- *River Flat Eucalypt Forest* EEC;
- *Warkworth Sands Woodland* EEC; and
- isolated stands of River Red Gum.

The Groundwater Impact Assessment (GIA) considered these potential GDEs and assessed the potential for groundwater impacts to occur in areas occupied by these potential GDEs. The GIA identified two areas within the zone of cumulative drawdown, that were labelled for the purpose of the assessment as GDE1 and GDE2 (see **Figure 6**):

- *Central Hunter Swamp Oak Forest* EEC (GDE 1);
- *Hunter Valley River Oak Forest* (GDE2); and
- individual River Red Gums, along Redbank Creek (GDE1 and GDE2).

The EIS predicts an approximate one metre decline in groundwater level at GDE2 due to cumulative impacts from mining (approved mining and the project). The assessment indicates that the drawdown is relatively limited in area and only impacts on a small portion of possible Hunter Valley River Oak Forest and possibly a small number of River Red Gum trees. Both species have a dependency on groundwater but are also drought tolerant. GDE1 is predicted to decline more significantly, as a result of approved mining and the project. The alluvium near GDE1 is predicted to become largely unsaturated due to the cumulative impacts of existing mining and the project.

The applicant's RtS confirms that potential project groundwater drawdown impacts on GDEs are predicted to be relatively limited in area. The PAR notes that the project would disturb approximately 12.9 ha of these potential GDEs along the riparian buffer zone of Redbank Creek. The area of Hunter River alluvium where some drawdown is predicted as a result of the project consists of modified vegetation and no GDEs are identified in this area.

The Department notes that local surface and groundwater levels have been substantially modified by approved and existing mining activities, and while the project would contribute to some additional drawdown, this would be by way of accelerating desaturation of the alluvium by approximately one year. Therefore, while the project is not predicted to materially increase existing or overall impact, the additional depressurisation would change the timing of that impact.

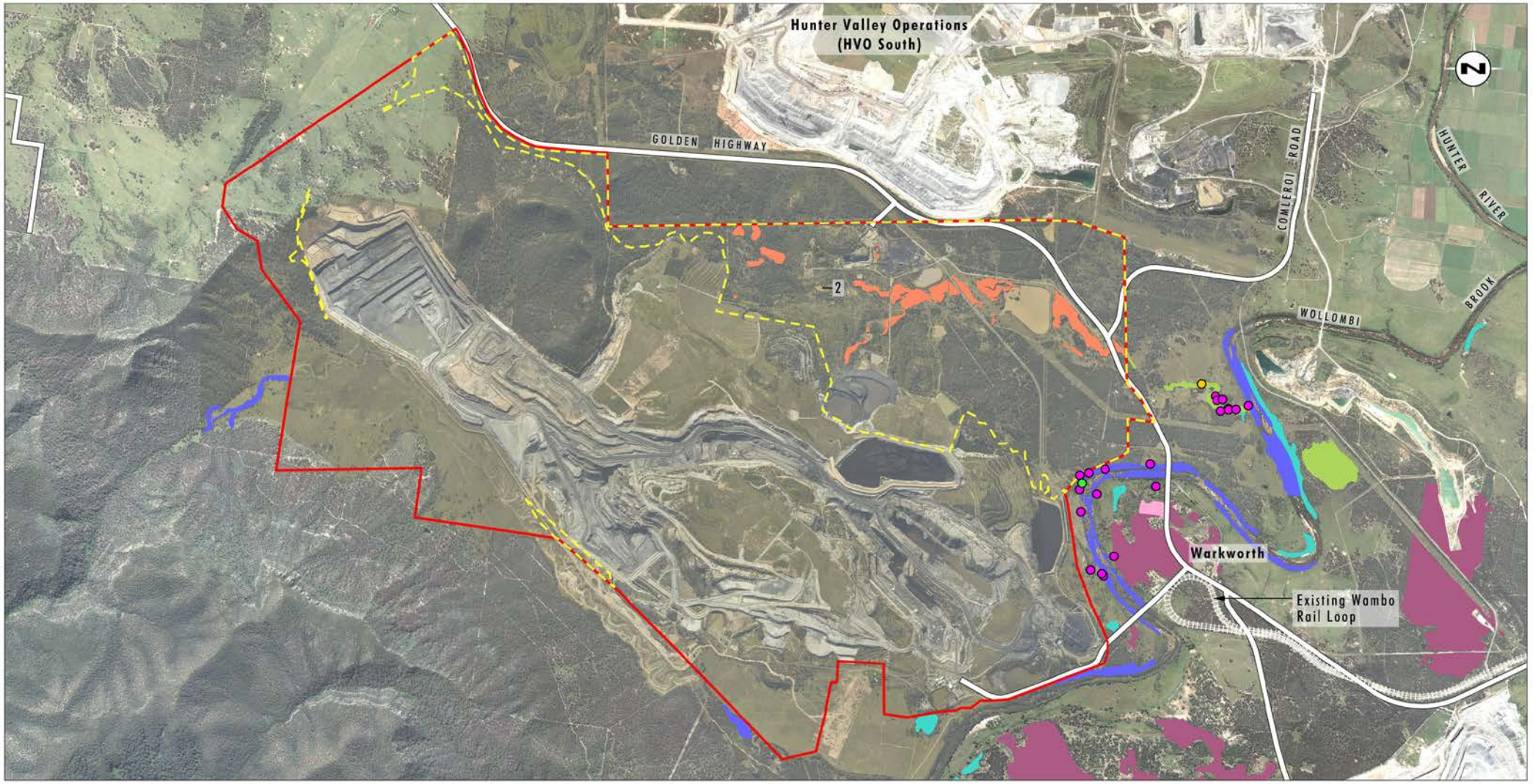

Image Source: AAM (2012), United (2015)
Data Source: Glencore (2014)

0 1.0 2.0 2.5km
1:50 000

Figure 6: *Potential Groundwater Dependant Ecosystems, Source: EIS, Umwelt, 2015*

Legend

- Project Area
- Conceptual Additional Disturbance Area
- River Red Gum Location
- Hunter Floodplain Red Gum Woodland Complex
- Central Hunter Swamp Oak Forest
- Hunter Valley River Oak Forest
- River Flat Eucalypt Forest
- Warkworth Sands Woodland
- 2 Moderate to Good Condition - Forest Red Gum Grassy Open Forest on Floodplains of the Lower Hunter
- 11 Moderate to Good Condition - Swamp Oak - Weeping Grass Grassy Riparian Forest of the Hunter Valley
- GDE 1
- GDE 2

FIGURE 6.31

Potential Groundwater Dependent Ecosystems

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The Commission requested clarification from the Department as to whether the assessment of GDE1 considered HVO South Mod 5, given its proximate location. The Department confirmed that the EIS did consider HVO South Mod 5 and other mining operations in the region. It found that the most significant modelled drawdowns within the Quaternary alluvium are notable east of the project site along the Wollombi Brook and Redbank Creek.

The ecological assessment for HVO South Mod 5 identified that the ecosystems in riparian zones within the flood plains along the Hunter River and Wollombi Brook that potentially use groundwater are opportunistic users only, inhabiting the niche on the floodplain due to the flooding regime rather than water supplied directly from the alluvial system. The Department concluded that HVO South Mod 5 would not alter the local flooding regime and impacts on these ecosystems are not predicted.

The Department of Primary Industries (DPI) Crown Land and Water Division (CLWD) (referred to as CLWD hereon) and the Independent Expert Scientific Committee (IESC) provided comments on the project in relation to GDEs, recommending the development of trigger action plans to manage potential impacts on the alluvial aquifers and GDEs. The Department considers that conditions could be employed to develop a comprehensive monitoring regime and implementation of adaptive management measures, including specific trigger levels to require remedial actions and/or offsetting. Such measures are consistent with those applied to other sites in the Hunter region.

The EIS considers the impacts of the project in accordance with the *NSW Aquifer Interference Policy* (NSW AIP), and groundwater impacts are considered further in **Section 6.5**.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendation is made in relation to GDEs that will require further information and/or assessment:

R23 The applicant should clearly demonstrate its commitment to the monitoring of all GDEs in a manner consistent with what is currently required on the site.

6.3.5 Fauna Impacts

The applicant's BAR (submitted as part of the RtS) identified threatened fauna species that have the potential to occur within the vicinity of the project. The BAR identifies that the project would be required to retire ecosystem credits for a number of fauna species, including birds, bats, marsupial and placental mammal species. In addition to ecosystem credits, the project would require 562 species credits to account for the clearance of 7.3 ha of potential breeding habitat for the Southern Myotis.

Targeted surveys were also undertaken between 2010 and 2016 to confirm the presence of key threatened and vulnerable fauna species, including:

- *Swift Parrot (Lathamus discolour);*
- *Regent Honeyeater (Anthochaera Phrygia)*;
- *Spotted-tail Quoll (Dasyurus maculatus)*; and
- *Koala (Phascolarctos cinereus)*.

The BAR states that the targeted winter bird surveys undertaken during June, July and August over a six-year period identified no sightings of Swift Parrots or Regent Honeyeaters (including breeding habitat) within the disturbance area. Spotted-tail Quoll are known to occur in the surrounding landscape, as evidenced by a recorded sighting to the east of the project disturbance area during a remote camera baiting survey in 2013, however, targeted surveys undertaken in 2013 and 2014 failed

to identify further sightings or confirm the presence of den sites or breeding habitat. The USHA noted that the Koala is unlikely to occur in the project disturbance area and no sightings were recorded during targeted surveys of the proposed disturbance area, concluding that it is unlikely that Koalas would use the forest and woodland communities in this area as a resident or on a long-term basis.

The applicant's RtS revised the disturbance boundary to avoid impacts on an additional 37 ha of land that had previously proposed to be cleared and proposes implementation of management measures for the progressive clearance of vegetation with the aim of minimising the extent of impacts on resident fauna. Notwithstanding, the applicant acknowledges that the proposed removal of foraging sources and habitat, and short-term reduction in connectivity would cause direct and indirect impacts to threatened fauna.

The Department considers that key threatened species would experience varying degrees of impact as a result of disturbance associated with clearing of derived native grasslands, mature woodland and forest, and re-disturbance of partially rehabilitated grasslands and woodland communities. The Department notes that the threatened species are relatively mobile and may in the future utilise woodland vegetation located in the project area, and acknowledges the potential for short-term impacts of the project on key threatened fauna species. However, it is satisfied that the applicant has minimised short-term impacts.

Rehabilitation of woodland communities would be established to contemporary standards and would provide an improvement on existing rehabilitation requirements under the existing Wambo consent. The Department considers that there would be a long-term benefit in supporting the recovery of threatened species once the ecologically complex native woodland communities across the site are established and connectivity of surrounding remnant vegetation realised.

6.3.6 Biodiversity Offset Strategy

The applicant's BAR proposed a biodiversity offset package, comprising of the following elements:

- upfront land-based biobanking sites, each comprising a mix of native vegetation communities and derived native grassland areas, including:
    - Highfields Offset site (428 ha);
    - Mangrove Offset site (259 ha); and
    - Wambo Offset site (56 ha).
- mine site rehabilitation of threatened vegetation communities across the final landform contributing 25 per cent of the overall biodiversity offset requirement (880 ha);
- contribution of funds towards supplementary conservation measures; and
- recovery actions or contributing funding to established biodiversity offset funds.

At its briefing with the Commission, the Department confirmed that the applicant had secured 62% of the ecosystem and species credits required under the project, which includes 878 ha of rehabilitated native woodland communities to be established in the post-mining landform.

On 11 December 2017, OEH provided a further response to the Department based on the applicant's 5 December 2017 submission. In relation to offset requirements, OEH notes that the applicant should ensure that offsetting for the regent honeyeater satisfies the requirements of both the FBA and the EPBC Act.

Since publishing the PAR, the applicant has acquired additional biodiversity offset sites, which it presented to the Commission during the applicant briefing on 7 February 2018. At this stage a detailed

assessment of these sites by the Department and relevant Government agencies has not occurred and therefore their biodiversity values have yet to be established. The additional sites include:

- Wambo Offset site increased from 56 ha to 338 ha, providing 198 ha of CEEC;
- Jerrys Plains Offset site, providing 215.1 ha of CEEC; and
- Brosi Offset site, providing 171.5 ha of CEEC.

The applicant proposes that offsets would be progressively retired in line with the mine operations plan (MOP) and would be delivered in three stages as the project progresses, and that mine rehabilitation would contribute to 25 per cent of the overall offset requirement. Currently the applicant has calculated an 11 per cent credit shortfall for Stage 1, which it states would be retired through either acquisition of further land-based offsets and/or payments into the Biodiversity Offsets Scheme as well as any other supplementary measures that may be appropriate.

The Department concludes that the proposed biodiversity offset package provides an acceptable pathway for the retirement of ecosystem and species credits, however it acknowledges that the applicant needs to secure additional biodiversity offset areas and is relying on rehabilitation to provide ecosystem credits. The Department considers that detailed consent conditions should be drafted to ensure that staged clearing of native vegetation does not occur prior to the applicant obtaining and demonstrating ownership of sufficient credits to account for each stage of mining operations.

Rehabilitation

The Commission received submissions that raised concerns with the proposed use of rehabilitated land to provide ecosystem credits. The applicant's RtS includes a number of additional measures to mitigate the extent of impacts on threatened species, including:

- establishment of anthropogenic habitat features;
- early and progressive rehabilitation of exposed lands; and
- retiring biodiversity offsets at key stages as mining progresses.

The Department notes that the FBA applies a significant discount to ecosystem credits generated by rehabilitation.

Of the total 2,448 ha of rehabilitated native woodland communities to be established in the post-mining landform, the applicant proposes to utilise 878 ha to be rehabilitated to a suitable quality to provide ecosystem credits, including:

- 258 ha of *Bull Oak Grassy Woodland of the Central Hunter Valley* – contributing 23 percent of the ecosystem credits for this community; and
- 620 ha of woodland confirming to CHVEFW CEEC – contributing 25 per cent of the ecosystem credits for impacts on *Narrow-leaved Ironbark-Grey Box Grassy Woodland of the Central and Upper Hunter.*

The Department acknowledges that well implemented rehabilitation can play an important role in promoting the recovery of local and regional biodiversity. However, establishing suitable and complex habitat and foraging resources on rehabilitated land requires significant time and resources. The Department notes that the timely rehabilitation and installation of supplementary habitat features should be pursued by the applicant to minimise the effects of delays in restoring removed habitat features.

The Department concludes that the project site would provide for the establishment and conservation of over 4,917 ha of native woodland over the medium to long-term (20-40 years), which it considers

would provide significant benefits given the proximity of the site to national parks and other existing offsets.

At its briefing to the Commission, the applicant presented a study titled: *'Assessment of Mine Rehabilitation Against Central Hunter Valley Eucalypt Forest and Woodland (CHVEFW) CEEC'*, commissioned by the NSW Minerals Council and prepared by Umwelt. The study considers the composition and condition of mine rehabilitation in line with CEEC at four coal mines in the Hunter Valley, namely:

- Mount Owen;
- Mangoola;
- Mount Thorley Warkworth/Hunter Valley Operations (jointly considered for the purpose of the study); and
- United.

The study notes that rehabilitated vegetation conforming to CEEC were found at each of the four sites and with a targeted effort, future mine rehabilitation across the central Hunter Valley could be established that focuses on CHVEFW CEEC. The study finds that further areas of mine rehabilitation that do not currently meet condition thresholds for CEEC, could be managed to conform through actions such as weed management and further planting of characteristic canopy species.

The Commission notes that the findings of the NSW Minerals Council study point to a lack of suitable offset land in the region and given the limited available land for offsetting purposes, it is likely that rehabilitated land may need to be considered further for this purpose in future. The Commission notes that while the preliminary findings identify opportunities for further consideration, the study has not been considered by the Department.

The Commission notes that rehabilitation objectives must be set out in any MOP and incorporated in a Mine Rehabilitation Plan should the project be approved. Final land form and rehabilitation matters are addressed in **Section 6.4**.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. The Commission is not satisfied with the information currently provided regarding biodiversity offset sites. The following recommendations are made that will require further information and/or assessment:

R24 The applicant must provide further details on project staging accompanied by accurate mapping. The staging must correspond with the project's biodiversity offsetting obligations. The information should include, but not be limited to, a detailed description of each project stage, what it represents and approximate timing, the specific biodiversity offset requirements for each project stage and staging of rehabilitation commitments.

R25 The applicant and the Department must clarify what the project's total offset requirement is alongside what has been secured at the time of any final determination.

R26 The applicant must provide an assessment of recently secured offset sites (or sites secured subsequent to this report) and update its Biodiversity Offset Strategy. The Department and OEH shall assess the adequacy of any such acquired sites.

R27 The applicant shall demonstrate that it has sufficient offsets secured and/or identified for all stages of the project prior to final determination of the project and a clear and detailed strategy for meeting future unsecured offsetting obligations required under the project. Additionally, assumptions in relation to the probability of purchasing additional land based offsets should be disclosed together with a reconciliation to any historical experience in undertaking such purchases.

R28 The Department should confirm the current status of discussions with the Department of Environment and Energy (DoEE) and OEH regarding offset requirements and give consideration to appropriate conditions of consent to reflect agency requirements.

R29 The applicant should demonstrate if additional land, beyond the proposed 878 ha of 'credit-generating' rehabilitated woodland is capable of equivalent outcome.

R30 The Department and OEH should review the '*Assessment of Mine Rehabilitation Against Central Hunter Valley Eucalypt Forest and Woodland (CHVEFW) CEEC'*, commissioned by the NSW Minerals Council and prepared by Umwelt and provide advice to the consent authority regarding the report's relevance to the assessment of the project.

6.4 Final Landform and Rehabilitation

6.4.1 Introduction

The applicant proposes a number of alterations to the currently approved post-mining landform at the Wambo mine site. Under the project, the applicant is seeking to:

- extend the Wambo open cut to the north and south-east;
- extend the depth of the Wambo open cut pit to – 105m AHD;
- construct a new open cut pit to – 155m AHD at the United mine site;
- integrate overburden emplacement areas (OEA) to establish tiered and micro relief landscapes behind the two progressing mine fronts;
- backfill the two approved Wambo final voids to consolidate into one shallow void and leave the United void to act as a ground sink;
- amend the distribution of woodland rehabilitation; and
- change the contouring and relief of the final landform.

The EIS states that the proposed final landform for the project represents a substantial improvement on the final landform across both mining areas, with extracted overburden being used to achieve a more natural final landform that incorporates micro and macro relief.

Following submissions received on the EIS, the RtS addressed a number of issues relating to rehabilitation and the applicant made a number of changes to the design of the final voids, including how existing rehabilitation would be incorporated as part of the project and compliance with EEC criteria.

Following the RtS, the Department requested further information from the applicant in relation to the proposed final landform and post-mining land uses. Specifically, the Department requested further consideration on opportunities to improve the final landform and rehabilitation outcomes for the site.

6.4.2 Mine Design and Proposed Sequencing

The EIS confirms that the sequence of mining and development of emplacement areas has been designed to permit early and progressive rehabilitation. The EIS presented conceptual staged mine plans, which identified the United pit commencing in the south-eastern end of the proposed mining areas, proceeding in a north westerly direction. By approximately Year 5, the pit would reach the existing United mine infrastructure area and CHPP, which would be decommissioned and removed from the site. This area would then be mined through as the open pit advances to the west. The mine plan includes mining through an area in the Arrowfield seam that was formerly subject to underground mining as part of United's former underground operations.

The approved Wambo open cut is currently progressing in a north, and north westerly direction until it reaches slightly beyond the limit of its current approval. It would then progress in a south easterly direction.

The applicant confirmed that the selected mine layout denotes the area required for optimum resource recovery when considering physical and geological constraints, including neighbouring properties, other mining operations, air and noise impacts, surrounding infrastructure and old underground workings.

The PAR notes that the applicant intends to continue mining in a manner broadly consistent with the mine sequence detailed in Wambo's 2015-2020 MOP. The principal difference between the project and the existing MOP is that the rates of extraction for the project would reduce to slow the progression of the Wambo pit to facilitate the operational sequencing of each pit. The Department notes that production rates would be adjusted as necessary throughout the life of the mine to optimise balance and throughput at the CHPP. **Figure 7** shows the staged mine plan for the site over the life of the project *(two pages over).*

The Commission raised a number of questions with the applicant regarding mine design and sequencing, which the applicant sought to address in its briefing. This information is provided below:

- why are two pits proposed rather than one:
  - the Wambo pit is a stratigraphic extension of an existing mining operation, while the United pit is targeting a new separate mining area, with lower strip ratios, which commences approximately 6 km from the existing Wambo pit;
  - strip ratios in the Wambo pit are higher compared to the United site due to intrusions from the Hunter Valley dyke and wash out channels, along with increases in overburden thicknesses due to increases in topography;
  - commencing mining of the United pit in the east would ensure no final void near Wollombi Brook and shifts the centroid of mining operations further away from Jerrys Plains and closer to the CHPP; and
  - varying strip ratios in each mining area in combination with the considerations described above, preclude the development of one large pit due to economic factors.

- what are the potential impacts on underground resources:
  - existing mine lease CL775 tenement depth extends to 5m above the Bayswater seam. Application for exploration has been lodged for the Bayswater seam to a depth of -900AHD; and

- the seams below the Vaux seam (lowest seam to be extracted in the proposed United open cut) are the Broonies, which are of insufficient thickness to support underground mining and the incremental strip ratio, pit depth increase and working room issues make it uneconomical

to pursue the Broonies utilising open cut methods. Accordingly, seams below the Broonies would not be sterilised for underground mining. depth of mining in the proposed Wambo pit (see **Figure 8**) *(two pages over)*:

  - depth of mining is determined by economic strip ratio and physical pit depth considering incremental costs, geotechnical stability and mine safety;
  - the Warkworth seam (RL -105m, yellow line) was selected in the Wambo pit due to the best strip ratio and acceptable pit depth cut-off;
  - the pit depth at the Vaux seam in the Wambo pit is up to 370m deep (RL -195m, red line), compared to 280m (RL -155m) in the United pit; and
  - the depth in both pits is similar, at approximately 280m. The varied RLs for each seam horizon in each pit does not reflect the pit depth, rather it takes account of differences in seam dip and natural topography.

- future coal resources influencing mine design:
  - formation of the joint venture influenced mine design to maximise resource recovery compared to options available as standalone entities; and
  - while both A444 lease and CCL775 contain additional resources, at this stage it is not deemed to be economic given physical lease constraints and insufficient resource knowledge at this time (see **Figure 2** for map of lease tenements).

The Commission acknowledges these responses provided in relation to final voids and notes they have contributed to its understanding of the issues. The Commission does make a number of recommendations in relation to final landform and rehabilitation options (see **Section 6.4.3**).

6.4.3 Final Voids

The project proposes two final voids. The applicant considered the options of no final void or a single final void but found retention of a void within each mining area would be necessary from a project viability perspective. The applicant also confirmed that the voids would prevent saline discharge to the surrounding natural environment, the applicant acknowledges that ultimately the void containing saline water would be unlikely to be suitable for other uses.

The GIA indicates that the proposed final voids would gradually fill with rainfall run-off and groundwater. Voids are predicted to reach a pit lake equilibrium level of approximately 55m AHD in the Wambo pit, and 20m AHD in the United pit.

The Department notes that there is no predicted interception of groundwater in the proposed Wambo final void due to the proposed rehabilitated landform. Subsequently, groundwater would be drawn to the deeper final void within the United pit.

(section continues on page 43)

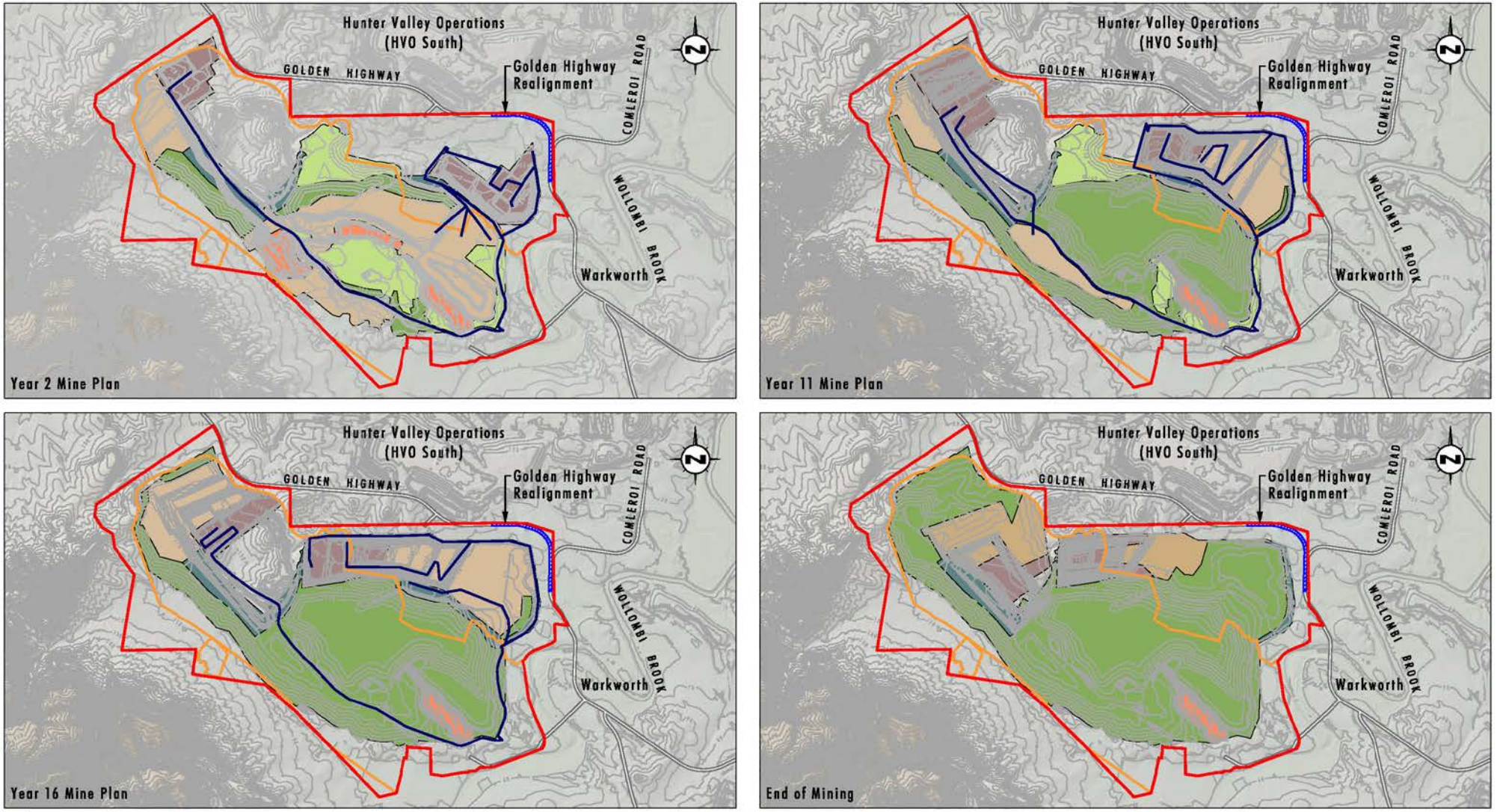

Figure 7: *Staged mining plans for the project, Source: Umwelt, 2018*

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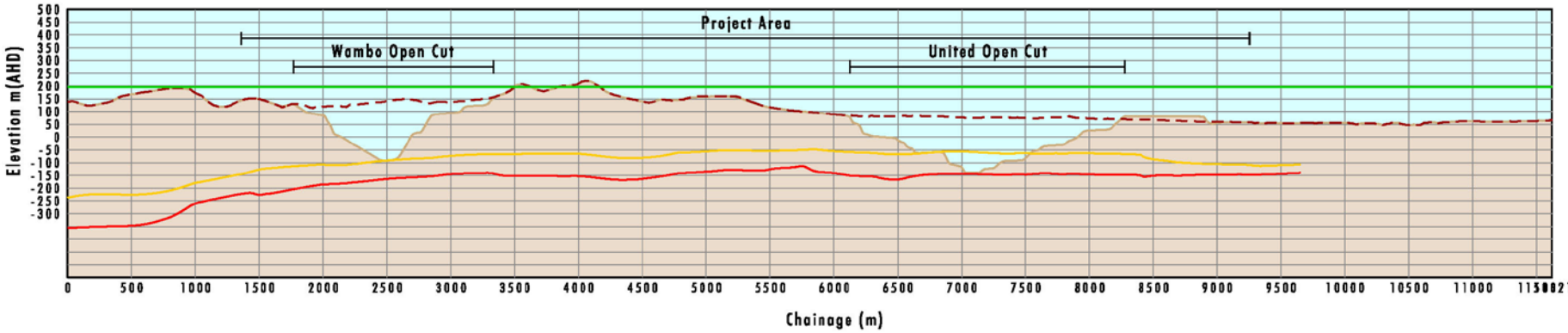

Figure 8: *Depth of mining in proposed open cut pits, Source: Umwelt 2018*

0 1.0 2.0 2.5km
Horizontal Scale: 1:50 000

0 0.5 1.0 1.25km
Vertical Scale: 1:25 000

Transect

The Commission requested clarification from the applicant regarding final voids and potential for filling voids. The applicant provided the following information in its briefing to the Commission:

- **significant volume of material** would be required to fill the voids, approximately 150 million bank cubic metres (Mbcm) of material, to achieve surface levels consistent with the surrounding area. Fill material can only be sourced from adjacent overburden emplacements, which would likely require disturbance of approximately 690 ha of rehabilitated areas, or delaying planned rehabilitation;
- **high cost** associated with filling voids. The RtS quoted a cost of $3/bcm for load, haul and dump costs only, equating to a total cost of filling the voids of $450 million (future dollars in approximately year 2041). This rate was based on steady mining operations, and life-of-mine (LOM) average load, haul and dump costs. Further analysis by the applicant shows the haul costs to be higher than LOM average due to longer hauls associated with the hauling material from ex-pit dumps down to pit bottom, estimating the total cost to be $4.20/bcm. The costs associated with re-establishing existing rehabilitation and rehabilitation of additional areas is included in the revised rate, which is estimated to total $630 million (future dollars in approximately year 2041) (dollars not discounted); and
- **extension of noise and dust impacts**, based on material movement rates of 38Mbcm per annum, filling the voids would extend mining activity and associated noise and dust impacts for a further 4 years.

Salinity Levels

The applicant's GIA determined that with a final void in place, the voids would act as a long-term groundwater sink reducing the discharge of poorer quality water from coal seam aquifers that would instead seep into the void rather than into the Wollombi Brook. While this would result in a loss of some groundwater flow into the Wollombi Brook alluvium, this loss is of saline water. Pit lake water levels are predicted to be between 30m and 50m below pre-mining groundwater levels, indicating that voids would represent long-term salt sinks.

The EIS presented elevated salinity levels, which were subsequently reviewed by the applicant. The applicant's Response to Request for Further Information (September 2017), presented revised modelling which reduced salinity levels in the United void by 63 per cent (from 35,000 mg/L to 13,000 mg/L) and the Wambo void by 94% (from 300,000 mg/L to 17,000 mg/L). The Department observes that the revised modelling is more aligned with salinity levels typical of final voids associated with large-scale mining in the Hunter Valley.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided in relation to final landform considerations, it is not satisfied with the current assessment of options and the environmental considerations regarding these options. The following recommendations are made that will require further information and/or assessment:

R31 The applicant and the Department should give thorough consideration of the full range of rehabilitation options, including filling of voids. This work must include a detailed assessment of any beneficial and/or adverse environmental consequences of filling voids, including a detailed assessment of salinity and water related impacts for all options.

R32 The applicant must provide a discounted costing evaluation for a final landform outcome that eliminates voids.

6.4.4 Final Landform Design

The landform design has developed progressively throughout the application process. Following the RtS process, the Department and a number of agencies, raised residual concerns over aspects of the final landform and rehabilitation plans contained in the applicant's RtS.

In response, the applicant submitted its Response to Request for Further Information (September 2017), which considered several alternative mine plans and final landform options. The applicant noted that a key determining factor in the selection of the final project mine plan was that it resulted in an improved final landform outcome across both mining areas, compared to other options considered. Some of the alternative options resulted in an additional final void, or a higher emplacement area at United with little assimilation of this landform with the approved final landform at Wambo. Overall, the applicant considered these alternatives resulted in a lack of landform integration across the site.

The applicant's revised final landform utilises a natural landform design incorporating micro-relief principles, the process of which would be undertaken as part of the detailed mine planning process completed through MOPs for the operation. The applicant describes the key objectives of this approach, which include:

- the drainage density of the final landform is to reflect the nature of the drainage patterns in surrounding landforms;
- steeper slopes are to be located higher in the catchment (that is, where water flows are smallest), with slope gradients flattening out downstream;
- drainage lines would have both channel and floodplain components to provide stability during frequent flood events; and
- gentle flow transitions that emulate natural transitions and maintain a balance between scour risk and sediment load.

The applicant considers that the micro-relief design process results in a more natural looking landform, reducing the visual impact of the post-mining landscape (see **Figure 9**). The applicant confirmed that the detailed design of the natural landform would be progressively developed as part of the detailed mine planning process and incorporated in staged rehabilitation plans contained in the MOP.

The Department has also considered the additional micro-relief, macro-relief and final void treatments and is satisfied that the revised landforms would deliver acceptable environmental outcomes. While the PAR acknowledges that the applicant could pursue additional landform treatments, such as equilibrating water quality between the two final voids, the Department does not consider these measures to be necessary given the final void lakes are now expected to achieve salinity levels typical of other mines in the Hunter Valley.

Final Land Use Options

The indicative post mining land use, as proposed in the applicant's EIS, include:

- the establishment of native vegetation communities;
- rehabilitation forming part of the biodiversity offset strategy;
- areas of open woodland; and
- areas that may suitable for agricultural purposes.

The applicant's September 2017 response to submissions, states that its commitment to revegetation and conservation to an extent limit, potential future land uses, with remaining areas proposed for agricultural land. The applicant considers there are a range of other potential land uses that may be

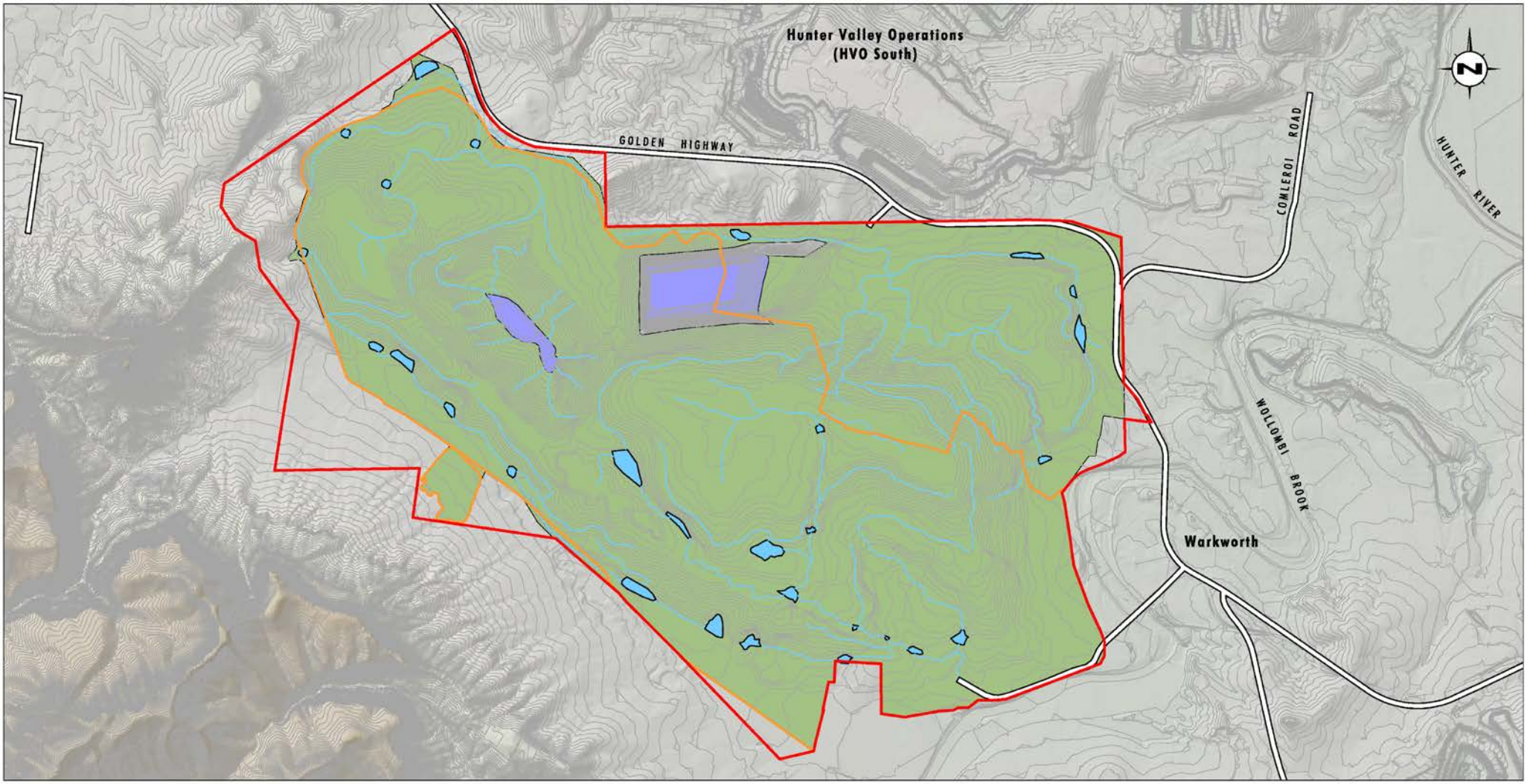

Figure 9*: Conceptual Micro-relief Final Landform, Source: Umwelt, September 2017*

FIGURE 2.3

Conceptual Micro-relief Final Landform

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compatible, such as intensive agricultural uses in specifically identified areas, and activities such as active recreational uses in native vegetation areas. The applicant has also committed to investigate the potential to stock the United void with suitable fish species that could support recreational fishing opportunities. In addition, the applicant commits to further investigate post mining land uses for the final voids. The applicant notes that this would be done as part of developing the detailed mine closure plan and could include consideration uses such as installation of a pumped hydroelectricity generation facility.

As outlined in **Section 4.3**, the Commission notes that Singleton Council raised concerns with the future strategic land use outcomes for the region and the long-term post mining landscape.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendation is made that will require further information and/or assessment:

R33 The applicant should further consider potential final land use options and the feasibility of delivering the options presented in its application documentation. The Commission recommends consulting Singleton Council as part of this process.

Final Revegetation Strategy

The applicant proposes to use a mixture of native woodland communities and grasslands for the rehabilitation of the post-mining landform (see **Figure 10**). The applicant describes its approach to the final landform and revegetation strategy as comprising three broad categories:

- ecological rehabilitation (including woodland conforming to CHVEFW CEEC as part of the biodiversity offset strategy for the project and to provide ecosystem functions in the rehabilitated landscape);
- grassland with pockets of woodland vegetation; and
- agricultural pastural land.

The final landform and rehabilitation strategy comprises the following key components:

- a minimum of approximately 878 ha of ecological rehabilitation, including approximately 620 CHVEFW CEEC;
- approximately 1,570 ha of native open woodland vegetation in rehabilitated landform;

The applicant's Response to Request for Further Information (September 2017) notes that reinstatement of 620 ha of CHVEFW CEEC directly relates to additional ecological impacts of the project and establishment of 1,570 ha of additional native open woodland vegetation maintains the existing rehabilitation commitments under Wambo's existing development consent under the EPBC Act (EPBC 2003/1138). Overall, approximately 2,450 ha of native woodland would be established in the rehabilitated landform, approximately 80 per cent of the total project area.

The applicant's 5 December 2017 response to the Department, provided clarification on the final biodiversity impact and offset requirements. The response provided details on the composition and location of rehabilitated woodland communities, and riparian vegetation to be re-established along drainage lines and areas designated for the establishment of vegetation communities compliant with CHVEFW CEEC and Bull Oak Grassy Woodland. The PAR confirms it is satisfied that the additional information clarifies the proposed rehabilitation outcomes and any further detail, such as rehabilitation objectives, completion criteria and specifics of preferred feed trees and habitat features could be included in an overarching Rehabilitation Strategy for the project.

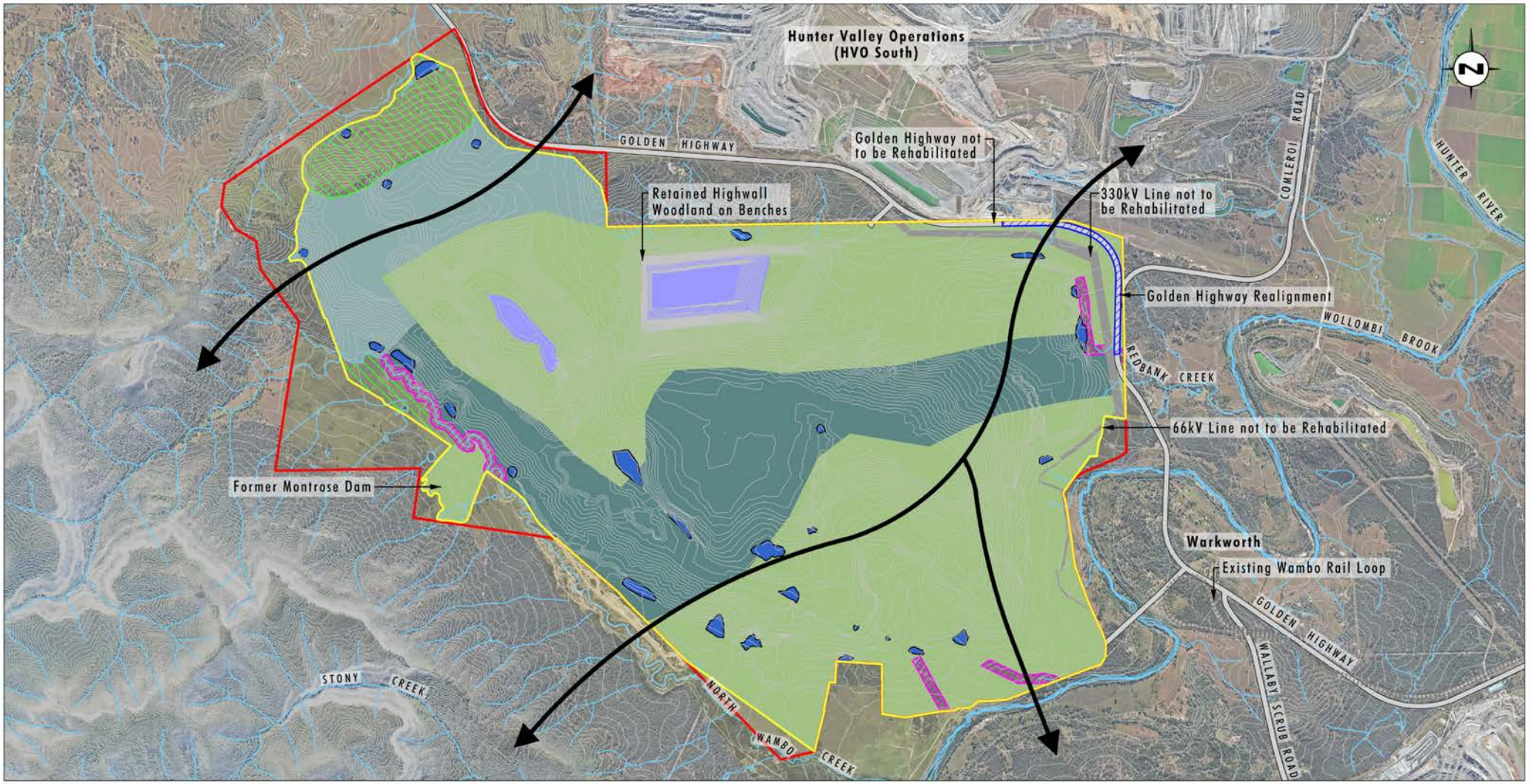

Image Source: AAM (2012), United (2015)
Base Data Source: Glencore (2015), LPI (2009)
Note: Contour Interval 10m

Figure 10: *Conceptual Ecological Mine Rehabilitation, Source: Umwelt, September 2017*

Legend

- Project Area
- Conceptual Rehabilitation Area
- Habitat Corridors (existing and proposed vegetation)
- Riparian Vegetation
- Grassland (Agricultural)
- HU905 - Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter conforming to *Central Hunter Valley Eucalypt Forest and Woodland CEEC*
- HU906 - Bull Oak grassy woodland of the central Hunter Valley
- Woodland/Open Woodland

FIGURE 2.4

Conceptual Ecological Mine Rehabilitation

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In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. The Commission is not satisfied with the information provided in relation to rehabilitation outcomes and makes the following recommendations that will require further information and/or assessment:

R34 The applicant should demonstrate how it can ensure successful staged rehabilitation, in the short, medium and long-term, in accordance with its stated biodiversity outcomes. In particular, it must clearly demonstrate matching of the timing of staged mine development with the biodiversity offset requirements.

R35 The applicant should provide further and better evidence to support the suggested ability to establish rehabilitated woodland communities to the requisite extent and standard specified in the rehabilitation offset plan.

R36 The Department should consider establishing conditions, should the project be deemed suitable to proceed, that ensure any rehabilitation outcomes intended to be relied upon by the applicant for offsetting are, in fact, able to achieve the requisite standards and within specified time periods.

6.4.5 Rehabilitation Standards and Regulation

The Commission requested clarification from the Department as to the regulatory and compliance framework that applies to existing mining operations throughout the State. Specifically, the Commission queried how rehabilitation is regulated, and the compliance framework for ensuring rehabilitation objectives are achieved and commitments required by conditions of consent met.

The Department confirmed that the compliance team carry out site inspections, which include a review of rehabilitated land. The Department's Compliance Policy (2016) sets out the Department's compliance framework, the investigation and compliance monitoring approaches and regulatory responses. The policy applies to all state significant projects and developments and sets out a risk-based approach to guide Department decision-making so that compliance activities are effective and consistently applied.

6.5 Water Resources

6.5.1 Surface Water

The EIS was accompanied by a Surface Water Assessment (SWA), prepared by Umwelt. The assessment considered the potential impacts of the project on water resources, the environment and downstream water users.

Catchment Areas

The project site is located within the catchments of the Wollombi Brook and Waterfall Creek, both of which are tributaries of the Hunter River. The catchment area of Wollombi Brook includes the sub-catchments of Wambo Creek, North Wambo Creek and Redbank Creek. The existing catchment areas have been significantly modified due to historic mining operations, including the north Wambo Creek diversion, reductions to catchment areas and changes in flow volumes.

The project would result in changes to the final landform, resulting in the need to divert and manage runoff from operational and disturbed areas. The EIS considers the changes in catchment areas relative to the currently approved final landform. The project would result in:

- minor reductions to Wollombi Brook (0.3 per cent) and North Wambo Creek (seven per cent) catchments;
- a moderate reduction to Redbank Creek catchment (33.9 per cent); and
- an increase in the Waterfall Creek catchment (26 per cent).

No change is predicted to the catchment area of Wambo Creek.

The Department acknowledges that smaller final catchment areas would result in changes to flow patterns, and would increase the number of no-flow days by less than 0.4 days, on average, per year. However, given the ephemeral nature of these waterways, the applicant considers that the proposed reductions in long-term catchment area represent a relatively small incremental impact, with predictions showing that changes in flows would be less than seasonal and annual variations.

The Commission however notes that there is a net loss of total catchment area, based on the information provided in both the EIS and PAR.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendation is made that will require further information and/or assessment:

R37 The applicant and the Department must confirm the revised total catchment area of any final voids based on the revised final landforms presented in the applicant's RtS and provide details of impacts predicted to be associated with any net catchment loss.

Flooding

Modelling undertaken indicate that the project would have negligible flooding impacts on the Wollombi Brook, including:

- negligible impact on flood depths within Wollombi Brook or Warkworth Village (<5mm), negligible impacts on flow velocities in Wollombi Brook (<0.01m/s) and minor increases in flow velocities in North Wambo Creek (<0.2m/s);
- no changes to flood hazard categories on or adjacent to private land, including Warkworth Village; and
- no impact on accessibility during floods or flood evacuation routes in Warkworth Village.

The applicant's proposed mitigation measures include scour protection and erosion and sediment controls. OEH recommended conditions be imposed relating to updated flood modelling to account for the recent Council commissioned flood study, and design parameters to address potential flooding impacts during the realignment of the Golden Highway and flood protection levee. The Department considers that with the measures in place, the proposed changes to catchment areas, construction of the highway realignment and flood levee would not alter flood impacts on privately-owned properties.

The Department confirms that OEH reviewed the flooding component of the applicant's assessment against a recent flood study commissioned by Council. OEH noted that the applicant's assessment generally indicated a higher degree of flood affectation in the catchment areas than the Council commissioned study and was therefore conservative and acceptable.

Surface Water Balance and Licencing

The SWA considers predicted surface water balance, which has been modelled as an integrated system across the whole of site, including the project and the existing Wambo underground mining operations, CHPP and rail facility. The modelling identifies that the project would have a negative site water balance, based on median rainfall conditions. With consideration of the Hunter River Salinity Trading Scheme (HRSTS) licenced discharges, it is close to neutral.

Overall, average inflows are predicted to total 6,316 megalitres/year (ML/year), while average outflows total 5,861 ML/year (combined with an average discharge of 550 ML/year), indicating a net average water deficit of approximately 96 ML/year.

The water balance modelling predicts that the volume of water stored on site would range between 4,500 ML and 3,500 ML during the first two years of the project and then would decrease to approximately 2,000 ML over the remaining life of the project. This would be accommodated within the available onsite storage capacity for the life of the project.

The PAR states that any water deficits could be met through licensed extraction from Wollombi Brook and the Hunter River. The modelling suggests that existing Water Access Licences (WALs) are sufficient to meet all future predicted water extraction requirements. Overall, the Department is satisfied that the project would have a reliable water supply.

The applicant proposes to source water for its operations from on-site rainfall run-off, groundwater inflows to mining areas, transfers between dams and supplementary supplies form Wollombi Creek and the Hunter River. The WALs currently held by United and Wambo, include:

- United – holds WALs to extract up to:
  - 300 ML/year from the Hunter River;
  - 100 ML/year from Wollombi Brook; and
  - 200 ML/year from Dam 1 located on Redbank Creek.
- Wambo – holds WALs to extract up to:
  - 1,000 ML/year of high security water from Hunter River; and
  - 350 ML/year under any flow regime; and 400 ML/year when flow is greater than 38 ML/day (total of 750 ML/year) from Wollombi Brook.

The SWA notes there are no known licensed water users on waterways immediately downstream on the Wollombi Brook or Waterfall Creek, however there are licensed water users downstream of the project on the Hunter River. Given the regulated nature of this river and the predicted negligible flow impacts, the Department is satisfied that downstream water users would not be adversely impacted. The Department notes that existing WALs are sufficient to meet future predicted water extraction requirements.

In terms of licensing to discharge water, United holds two credits to discharge under the HRSTS, however there are no current licenced discharge points on site, or under its EPL. The applicant's Water Balance Assessment submitted as part of the SWA states that Wambo holds 48 HRSTS credits (having formerly held 61 HRSTS), and United holds two credits, to discharge water. The PAR notes that Wambo holds 61 credits to discharge water under the HRSTS. The applicant confirmed that existing Wambo HRSTS discharge infrastructure would be utilised for the project and the EPA has indicated this could be accommodated within the EPL.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with

much of the information provided up to this point, the following recommendation is made that will require further information and/or assessment:

R38 The applicant and the Department must confirm the extent of HRSTS credits held by the project.

Surface Water Quality Impacts

The SWA monitoring data shows variable results for most water quality parameters which is expected given the ephemeral nature of drainage systems. The applicant considers that the existing Water Management Systems (WMSs) are successfully mitigating potential impacts to watercourses. The SWA indicates that water quality in Wollombi Brook shows little variation at monitoring locations upstream and downstream of existing operations, and that the watercourse is not exhibiting any measurable impact due to current mining operations.

The Department considers the potential sources of impact on surface water quality include the discharge of mine water, overflow/failure of sediment ponds and spillage of tailings. However, it considers the risk of impact from these sources to be low and the existing management measures implemented on the Wambo mine site would continue. The Department notes that in addition to the requirements of any EPL, all mines that hold a licence to discharge into the Hunter River system also need to operate in accordance with the HRSTS. According to the conditions of Wambo's EPL (529), discharge can only occur into Wollombi Brook when flow exceeds 500 ML/day. The SWA notes that any mine water discharges would be undertaken in accordance with the provisions of the HRSTS and using existing Wambo and United credits.

The Department is satisfied that with appropriate monitoring and response measures in a Water Management Plan (WMP), the project has a low risk of impact to off-site water quality.

With regard to cumulative impact, the Department notes that watercourses in the vicinity of the project are highly modified and have been subject to previous impacts. Other industries, including the agricultural industry have contributed to changes to watercourses in the region. In its consideration of cumulative impact, the PAR indicates that the project is not predicted to have significant impacts on downstream water quality flows, flooding or water users. The Department is satisfied that the WMS for the project is appropriate having been designed in accordance with relevant Government standards to limit potential impacts on downstream water quality.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with the SWA, it is not satisfied with the information provided regarding cumulative impacts on downstream water users. The following recommendation is made that will require further information and/or assessment:

R39 The applicant and the Department shall provide additional information and assessment regarding the extent of any cumulative impact from both the project and other mining operations on the downstream environment.

Existing Water Management Systems

Separate WMSs are currently in place at the Wambo and United mine sites, which include mine dewatering systems, water storages, sedimentation and retention basins, and drains. The SWA notes that both sites have similar key objectives for water management, which would be maintained.

The water management strategies currently employed at both the United and Wambo sites seek to avoid, mitigate and manage potential impacts and outline the following:

- current water management systems;
- water quality monitoring programs;
- water balance; and
- reporting mechanisms.

CLWD and the Department requested further information on the applicant's proposed clean water diversion measures. The project comprises six clean water dams, of which one is proposed to remain as part of the final landform to minimise the risk of downslope erosion by managing surface water flow rates from the upslope catchment area into the United void. The applicant has committed to maintain a buffer of 370m between the proposed open cut mining area and Wollombi Brook, to minimise potential impacts.

Performance Measures, Monitoring and Management

The Department recommends that the WMSs be updated under a new consolidated Water Management Plan for the project. The updated management plan would be required to stipulate monitoring of potential pollutants in sediment dams and downstream creeks. The Department considers a performance measure would be appropriate to require the design of sediment dams to be in accordance with the 'Blue book'.

CLWD's standard consent conditions relating to preparation of a Water Management Plan, expansion of the existing monitoring network, trigger action response plans (TARPs), and rehabilitation measures for watercourses, would be applied to any future consent for the project.

6.5.2 Groundwater

The EIS was accompanied by a Groundwater Impact Assessment, prepared by Australasian Groundwater and Environmental Consultants, which was subsequently peer reviewed by Dr Noel Merrick. CLWD raised concerns with potential conflicts of interests, and at the Department's request, the applicant commissioned a second peer review, which was undertaken by Dr Frans Kalf, of Kalf and Associates Pty Ltd.

The groundwater environment is characterised by two main aquifer systems, comprising the Quaternary alluvium and a less productive, deeper and more saline hard rock aquifer system.

Drawdown in Alluvial Aquifers

The GIA states that the Quaternary alluvium experiences drawdown up to 3 km north of Wambo open cut and 2 km east of United open cut. The most significant modelled drawdowns within the Quaternary alluvium are predicted to occur east of the United open cut pit along Wollombi Brook and Redbank Creek, and north along the edge of the Hunter River alluvium.

The groundwater model identifies the theoretical potential extent of drawdown, which assumes a largely homogenous alluvial zone, and as these zones have variable properties, the actual drawdown may be less than predicted. On this basis, the Department considers drawdown impacts to alluvial aquifers to be acceptable.

The applicant has sought to minimise impacts on these alluvial aquifers by providing a 370m setback to the Wollombi Brook. The minimum setback required under the NSW AIP is 200m.

The GIA considered the potential cumulative drawdown associated with the project. As noted above, cumulative drawdown within the Quaternary alluvium already extends along Wollombi Brook and the Hunter River, adjacent to other mining operations, including Wambo, Hunter Valley Operations, Ravensworth and Mount Thorley Warkworth. The PAR notes it is satisfied that cumulative drawdown impacts on the Permian aquifers are not significantly greater than those already approved.

The GIA notes that cumulative impacts from approved mining operations, including those operations listed above, reduce the net baseflow to the Wollombi Brook alluvium from 1,450 ML/year to 1,000 ML/year. The project contributes a minor net baseflow of between 0.5 ML/year and 37.4 ML/year (in Year 8) of the cumulative impact on baseflow in Wollombi Brook, approximately three per cent of the total. The modelling also indicates there would be a gradual reduction of flow from 3,000 ML/year to 2,900 ML/year on Hunter River baseflow, with the project contributing up to 57.7 ML/year, or two per cent of this cumulative impact.

The Commission requested clarification from the Department as to whether drawdown in alluvial aquifers along the Hunter River can be quantified. The Department confirmed that the GIA predicts cumulative drawdown contours in the Quaternary alluvium adjacent to the Hunter River of up to 10m. The response assisted the Commission's understanding of the overall cumulative drawdown impacts.

Hard Rock Aquifers

The GIA considered the potential drawdown depressurisation predicted to occur as a result of the project. The zone of depressurisation from the extraction area is predicted to extend up to:

- 2.5 km southwest in the Wambo seam;
- 2.5 km west and up to 2 km south in the Glen Munro seam; and
- 3.5 km from the edge of the proposed extraction area in the Arrowfield seam.

The GIA identifies that the magnitude of depressurisation is largely restricted to the west of the project area and the extent of drawdown is generally within the area of existing drawdown from currently approved mining operations to the north, south and east. In all coal seam layers, depressurisation is generally less than 10m at a distance of 1.5 km from the edge of the pits.

The applicant's GIA identifies one non-active privately-owned bore, located in the hard rock aquifer, that is likely to experience drawdown as a result of the project. The modelling predicts a maximum 6.7m decline in groundwater levels, with the project predicted to account for 6.1 m of this drawdown. The applicant confirmed that the impacts are greater than the Level 1 minimal impact considerations in the NSW AIP, however the Department indicates that this bore is not currently serviceable and is located on a property recently purchased by the applicant. The GIA confirms that following mining, groundwater levels would recover, and the maximum drawdown is predicted to be 3.1m below 2015 groundwater levels, of which the project accounts for 1.8m of water level drawdown. The bore is predicted to remain usable but with a reduced pump peak pumping capacity due to the predicted decline in water level.

The PAR concludes that shallow alluvial and hard rock groundwater aquifers have been affected by historical mining operations in the region. While mining operations continue in the region, this impact will continue. The project would result in depressurisation of the hard rock aquifers in the coal seams, however the Department considers the impact to be of limited significance as the water is generally saline and unsuitable for domestic or agricultural purposes.

Groundwater Flux

The GIA notes as the Permian strata becomes depressurised, flow from the Permian to the alluvium within the zone of depressurisation will progressively decrease. This can be considered beneficial as it reduces the inflow rate of higher salinity groundwater from the Permian to the overlying alluvium. The results of the modelling identify that the project reduces flow from Permian to the alluvium along Wollombi Brook by up to 40 ML/year.

The currently approved operations at Wambo and United are predicted to reduce flow from the Permian alluvium along Wollombi Brook by up to 175 ML/year. The GIA considers this is a relatively small additional impact on top of the cumulative impacts for currently approved mines. The Department does not consider this to be minor and considers that the loss of up to 40 ML/year, equating to 23 per cent, is a moderate impact. Regardless, the PAR states that as the Permian strata becomes depressurised, flow from the Permian alluvium would progressively decrease, reducing the inflow rate of saline groundwater, subsequently leading to a gradual improvement in water quality in the alluvium.

The Department notes that the Hunter River alluvium is naturally leaking into the underlying coal measures and is therefore a losing system. Most of this loss is naturally occurring. The Department notes that cumulative impacts are evident with increasing loss over the project, however this is a relatively small additional impact. The natural loss would also continue regardless of the project. The Department states groundwater take in Year 24 of the project would be similar to what is currently approved.

The Commission acknowledges the Department's advice that the project would result in a decline in groundwater from cumulative mining impacts. The Commission understands that the project would accelerate the impact, but is not predicted to materially increase the overall magnitude of the impact.

Existing Water Management Systems

The United and Wambo mine sites have a groundwater monitoring network comprising 77 bores and 24 vibrating wire piezometers (VMPS), of which 27 bores and 11 VMPs are currently monitored under Groundwater Monitoring Programs.

The applicant proposes to continue the program monitoring groundwater level and quality and proposes the installation of additional monitoring bores, including periodic sampling of stygofauna to account for recommendations made in its EIS. The Department notes that commitments made in the EIS would be formulated into the requirement for a new Water Management Plan, including trigger levels for water quality and levels, in accordance with CLWD requirements.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendations are made that will require further information and/or assessment:

R40 The applicant should confirm why only 27 of 77 bores and 11 of 24 VMPs are currently monitored under Groundwater Monitoring Programs.

R41 The applicant and the Department should confirm the extent to which privately owned bores and mine owned bores, located within the alluvial aquifers, would be impacted by the project.

R42 The applicant should provide details of the proposed additional monitoring bores, including periodic sampling of stygofauna, to account for recommendations made in its EIS.

Performance Measures, Monitoring and Management

The Department indicates that standard consent conditions relating to groundwater monitoring and management would be applied to the project, should it be approved. Measures include:

- preparation and implementation of a Water Management Plan, including a program to monitor groundwater levels and quality;
- installation of additional monitoring bores; and
- provision of compensatory water supplies for any affected groundwater user.

The PAR sets out the groundwater licensing requirements for the project. Both the Department and CLWD are satisfied that the water licences required for existing operations and the project are held within currently held entitlements.

6.6 Matters of National Environmental Significance

On 7 December 2015, the project was determined to be a 'controlled action' by a delegate of the Commonwealth Minister for the Environment. Following review of the applicant's referral documentation, the DoEE determined that the project would be likely to have significant impacts on nearby water resources.

The project was referred jointly by the Department and DoEE to the Commonwealth's IESC on Coal Seam Gas and Large Mining Development for advice on surface and groundwater impacts and potential impacts on downstream watercourses and receiving environments. In considering whether to approve the action, the Commonwealth Minister must consider advice from IESC. The Department notes that the IESC's approach is to consider all impacts associated with the project, rather than the increase in impacts over those currently approved.

The applicant responded to matters raised by the IESC in its RtS. The PAR provides a summary of the key issues raised by IESC including an overview of the applicant's responses to the issues raised in its RtS. The Department notes that its assessment of water resources addresses IESC's primary concerns. Other issues raised by IESC, and considered below include:

- tailings and water storages;
- geochemical assessment; and
- monitoring and management strategies.

Tailings and Water Storages

The IESC raised concern regarding the potential for the Wambo void lake and the Tailing Storage Facilities (TSFs) to become recharge sources for the Permian groundwater system and subsequently the alluvial aquifers and surface waters through upwards leakage.

The RtS states that due to extensive depressurisation of the Permian coal measures from approved and proposed mining, groundwater is drawn towards and into the active mine areas. The proposed United final void would act as a dominant groundwater sink, drawing in groundwater from the Permian coal measures and all saturated spoil at the site. The final void would not become a recharge source to any aquifers.

The RtS further notes that one new tailings storage facility (South Bates TSF) is proposed and the project would utilise two existing TSFs already approved. The United underground mine site is currently used as a water storage facility, which would continue as part of the project. Under this arrangement, excess water would be pumped underground and extracted as required for use on the site. The Department considers that the use of underground workings for storage of mine water is a good option as these areas would naturally fill with water from coal seams over time.

Geochemical Assessment

The IESC raised concerns that the EIS was not accompanied by a geochemical assessment. In response, the applicant commissioned a geochemical assessment as part of its RtS, prepared by GeoTerra: *'United Wambo Open Cut Coal Mine Project Waste Rock/Tailings Geochemical Characterisation and Acid & Metalliferous Drainage Assessment 2017*'. The assessment found that based on existing data, including that potential tailings from the project are likely to be non-acid forming, no specific overburden or tailings waste management handling, storage or testing procedures are considered to be required in regard to acid and metalliferous drainage (AMD) management.

The PAR notes that recovery modelling demonstrated, that post-closure, water surrounding the new South Bates TSF and in-pit spoil would flow towards the final voids and remain contained within the mine site. Accordingly, the Department is satisfied that there is minimal risk of groundwater within the in-pit spoil and proposed final voids influencing stratigraphy outside of the mine area, post-closure.

The Department considers that the geochemical assessment further supports this conclusion finding that during operations, the waste rock and tailings are unlikely to cause adverse changes in groundwater due to low AMD potential.

Monitoring and Management Strategies

The IESC recommended a number of monitoring and management strategies for the project. The Department notes that its assessment gave strong consideration to these strategies and that it is generally satisfied that the applicant's proposed monitoring and remediation measures are adequate to mitigate potential impacts.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendation is made that will require further information and/or assessment:

R43 The Department should provide additional clarity regarding satisfaction of the IESC's requirements. Alternatively, the Department should provide correspondence from the IESC to confirm its satisfaction with the revised project.

6.7 Visual Impact

6.7.1 Visual Impacts (including Realignment of Golden Highway)

The applicant's visual assessment, prepared by Umwelt, states that views of the existing Wambo overburden emplacement areas and infrastructure are currently available from surrounding

residential areas to the northeast and south. There are also significant views from the Golden Highway at Montrose to the northwest.

The applicant's visual assessment states that the key aspects of the project that have the potential to result in visual impacts include vegetation clearing and overburden removal, active mining operations, emplacement of overburden and rehabilitation. As mining in the approved Wambo open cut progresses north and removes a natural ridgeline, there would be increased visibility of the Wambo operations to receiver location to the north and north-west, including views of active mining areas and overburden emplacement areas.

In addition, the applicant notes that there is also the potential for visual impacts associated with the relocation of the Golden Highway and Transgrid 330 kV transmission line.

The assessment indicates that emplacement areas would continue to be the most visible element of the project from viewing locations to the south, east and northeast. However, the active mining face within the approved Wambo open cut would be the most visible element for viewing locations to the northwest as mining progresses through the main ridgeline.

The applicant states that the project would not substantially alter these views and the progressive rehabilitation of overburden emplacement areas from the early stages of the project and the shaping of the final landform to conform to the surrounding natural environment is expected to reduce the visual impact of emplacement areas.

The Department notes that despite the presence of mining activities in the region, many private residences and public areas are sheltered from such views by intervening ridgelines that traverse the Valley. The Department acknowledges that as a result of the project some areas along the Golden Highway would experience increased views of emplacement operations, as would some residences in Warkworth Village.

The Department is satisfied that the visual impacts of the project would be relatively minor when considered in relation to the existing operations, and that the improved final landform designs would integrate more naturally with the surrounding landform features and improve long-term visual amenity, post-mining.

The Commission acknowledges the potential for visual impacts as a result of the project, from the Golden Highway and surrounding residential properties. The Commission notes there are visual impacts associated with the existing Wambo open cut and these impacts are part of the approved project.

6.7.2 Management Measures

To assist in minimising the visual impacts of the project, the EIS states that the applicant would implement the progressive rehabilitation of emplacement areas and shaping of the final landform using natural landscape principles. In consultation and agreement with RMS and potentially affected landholders, the applicant would provide additional tree planting to screen views of the project from the Golden Highway and would continue managing mobile lighting to reduce the impacts of lighting at night.

The Department is satisfied that the long-term visual impacts of the project could be suitably minimised through appropriate landform design and progressive rehabilitation of the final landform.

The Department also notes that should private properties with views of the project claim to be significantly impacted, the applicant could undertake further assessment of these properties and, if necessary, implement further site-specific and targeted visual mitigation such as tree screening. The Department states that targeted visual mitigation for the HVGC to mitigate potential impacts of visibility from the realigned Golden Highway should be reflected in any conditions of consent.

The applicant confirmed with the Commission that it is in discussions with residences that may experience visual impacts as a result of the project, particularly due to the increasing overburden emplacement heights. The applicant confirmed it has discussed potential mitigation measures, including reorientation of verandas, visual screening and planting to act as a visual screen between residential properties and mining operations.

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. Whilst the Commission is satisfied with much of the information provided up to this point, the following recommendation is made that will require further information and/or assessment:

R44 The applicant and the Department should give further consideration to appropriate visual mitigation measures to address potential visual impacts resulting from the project on private residences, the Golden Highway and other viewpoints identified in the EIS.

6.8 Transition to Joint Venture

As outlined in **Section 1.2**, the joint venture agreement was signed by Peabody and Glencore on 25 November 2014. The Commission understands the following key elements of the joint venture agreement to be:

- Glencore to be manager of the joint venture;
- subject to the appropriate state and federal approvals, commencement of the joint venture is expected to commence once approval for the project is obtained;
- joint development of the lease areas owned by both parties, maximising resource recovery by removing surface boundary constraints and stratified leases;
- Wambo underground operations are excluded from the joint venture; and
- utilises shared capacity in Wambo owned CHPP and train loading facility, with Wambo to remain owner and manager of the CHPP and train loading facility.

The Commission requested clarification from the applicant regarding the transition to the joint venture. The applicant presented the transitional arrangement in its briefing to the Commission (see **Figure 11**).

In its review, the Commission has considered the EIS and supporting specialist reports, the PAR, briefings provided to the Commission and public submissions. The Commission is not satisfied with the information currently provided and makes the following recommendations that will require further information and/or assessment:

R45 The applicant shall provide a comprehensive transition to Joint Venture Strategy/Framework, including specific details on staging and/or triggers for when certain activities require a certain action, including (but not limited to):

- justification for duration of any transition process and conditions precedent for full commencement of all aspects of the joint venture open cut operations;
- a strategy for managing environmental compliance matters associated with the

joint venture as separate from Wambo underground operations;

- a framework for managing transition to full Glencore management, particularly in the short term when both Peabody and Glencore will be managing distinct, and adjacent, open cut operations (in addition to the Wambo underground operations);
- Community Consultative Committee (CCC) process and structure of a CCC for the overall mining complex, with the view of establishing a regional CCC;
- Environmental Protection Licensing, including licences that would require amendments under the joint venture;
- monitoring (air, noise) required under existing consents and how this would be managed under a joint venture arrangement; and
- Environmental Management Plans, triggers for transition to management plans likely to be required under the joint venture;

R46 The applicant shall provide a summary of the proposed total combined ROM coal outputs of the proposed joint venture open cut operations and the existing Wambo underground operations. Total proposed ROM production shall be reconciled against proposed maximum rail haulage rates.

R47 The Department shall incorporate a clear framework into the draft conditions of consent, to ensure that environmental management is appropriately transitioned from the existing consent to the new consent, should approval be granted.

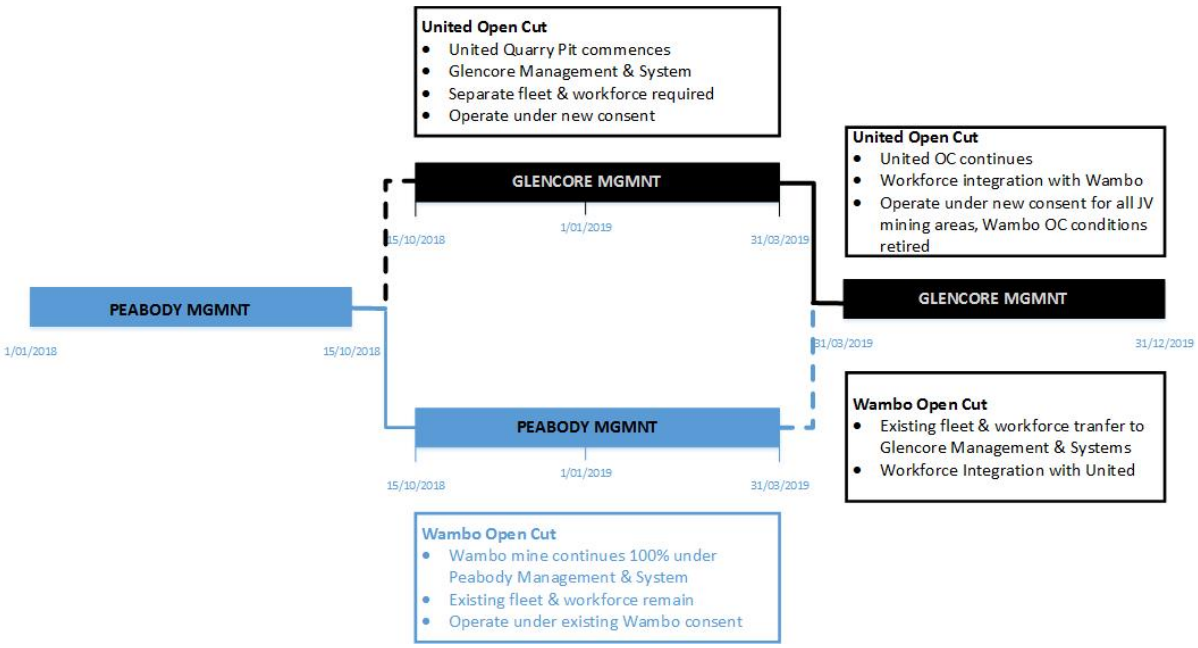

Figure 11*: Transitional arrangements, Source: Glencore, 2018*

6.9 Traffic, Transport and Public Infrastructure

6.9.1 Introduction

The applicant's EIS was accompanied by a Transport and Traffic Assessment (TTA), prepared by Transport & Urban Planning Pty Ltd, as the project is expected to impact traffic during the construction and the operation phase. The TTA considered the existing transport environment, the local access roads and their capacity to accommodate additional traffic. The TTA was prepared in accordance with

the Roads and Maritime Services' (RMS) *Guide to Traffic Generating Developments*, and *Austroads' Guide to Road Design* and *Guide to Traffic Management.*

6.9.2 Traffic Impacts

The TTA predicts an increase of traffic during peak hours associated with workers trips, on weekdays and Saturdays, during construction. However, the TTA states that the traffic increase would not affect the road network, or the service level of the intersection of Golden Highway with Wambo Mine Main Access Road and Wallaby Scrub Road.

The TTA predicts that during operations, the project would generate 238 workers trips per day during peak operations, to and from the mine site along the Golden Highway. The PAR states that these traffic impacts would most likely occur during morning peak hours, associated with the workers shift change. It also indicated that not all work trips would be new trips as approximately 250 employees of the predicted 500 employees, would be drawn from the existing Wambo workforce. The PAR acknowledges that principal intersections near the project have sufficient capacity to accommodate the traffic increase for the duration of the project.

6.9.3 Realignment of Golden Highway

The project proposes the realignment of a 2 km section of the Golden Highway to the northeast of the proposed United Pit. This would allow the applicant to develop the United Pit and access additional coal resources. Once operational, the realigned section of the highway would be an additional 800m in length and would increase one-way travel time by 30 seconds on the realigned section.

The PAR indicated that the design of the realignment is expected to be in accordance with the *Austroads* standards. It also states that the applicant has held several meetings with RMS in relation to aspects of the conceptual design and inclusion of a wide road corridor to allow future road duplication.

The Commission notes that the Department and RMS are satisfied with the realignment of the Golden Highway. In its meeting with the Commission, the Council did not raise any specific concerns regarding the proposed realignment works.

6.9.4 Realignment of Electricity Transmission Lines (ETLs)

The project proposes realignment of a 3.2 km section of Transgrid's 330 kilovolt (kV) ETL as well as sections of Ausgrid's 66 kV and 11 kV ETLs adjacent to the Golden Highway. The realignment of the highway and the transmission lines would also require the realignment of telecommunications and associated infrastructure.

The PAR states that the applicant has commenced discussions with relevant parties on the final design of the realignment, including:

- Ausgrid and Transgrid for the development of a detailed design;
- Hunter Valley Gliding Club on the proximity of the transmission line to their flight operations and visibility markers in accordance with the *Civil Aviation Safety Regulation 1998;* and
- Telstra for the telecommunications infrastructure aspects.

The Commission notes that the Department is satisfied with the proposed realignments and that any potential interaction can be managed through any conditions of consent.

6.10 Economics and Social Considerations

6.10.1 Economic Assessment

The applicant's EIS was accompanied by an Economic Impact Assessment (EIA) and a cost benefit analysis (CBA) prepared by Deloitte Access Economics (DAE). The EIA estimated that the project is expected to generate net benefits of $414 million (assuming a discount rate of seven percent) to NSW over its life, including $369 million (net present value) in royalties for NSW.

Other benefits include an additional $68.9 million (net present value) from company tax, and flow on effects to landholders and local businesses. The Department of Resources and Geoscience (DRG) reviewed the applicant's assumptions on semi-soft coking and thermal coal and estimated that the project would deliver royalties nearing $352 million.

Following the exhibition period, the Department commissioned a peer review of the applicant's economic analysis, conducted by the CIE, which concluded that despite being consistent with relevant guidelines, the analysis required further consideration of the estimation of overall benefits and coal price, including residual environmental and social impacts, and greenhouse gases cost attribution. However, the peer review also concluded that the project would still deliver net benefits regardless of the changes, including considering the lowest end of coal price assumptions and full cost attribution of greenhouse gases to NSW.

The applicant indicates that the current Wambo open cut contributes to the local and regional economies through employment, direct and indirect support services, local expenditure, tax and royalty payments. The applicant indicates that the proposed project represents an opportunity to provide continued employment for the existing Wambo open cut workforce and indirect services when it ceases operations in 2020. The proposed project is expected to create an additional 120 jobs during construction and 250 jobs when fully operational.

The PAR supports the conclusions of the applicant's EIA and the peer review and is satisfied that the EIA is broadly consistent with NSW Government guidelines.

The Commission requested clarification as to the costs associated with filling voids, and whether the costs presented in the applicant's EIS were dollars of the day or net present value. The applicant provided further detail on costs of filling voids and presented some revised costings, which were considered in **Section 6.4**, together with recommendations.

6.10.2 Social Assessment

The applicant's EIS was accompanied by a Social Impact and Opportunities Analysis (SIOA), prepared by Umwelt. The SIOA considers the non-monetary costs and benefits of the project and the perceived impacts and opportunities of the project on nearby communities. The SIOA found that the project is unlikely to give rise to significant change across any key community capitals, including natural, economic, human, physical and social. The EIS notes that a range of strategies would be implemented to seek to minimise social impacts, where they occur, and maximise benefits.

The Department's PAR notes that the SIOA included information from stakeholders within the Singleton LGA, including nearby communities of Warkworth Village, Jerrys Plains and Bulga, regarding existing operations, perceptions of potential impacts and improvements in communication and interactions between the applicant and the community. The Department notes that 60 per cent of the 665 participant stakeholders were employees of either Wambo or United, or suppliers to either

Wambo or United. The Department acknowledges that while this may reflect the nearby community as employees and suppliers live locally, it may also overestimate the perceived benefits of the project.

The Department acknowledges that the project would have a social impact on the local community and the social dynamics and community cohesion has experienced changes as a result of mining operations throughout the region over time. The Department's PAR notes that the project's social issues are directly linked to the Department's preliminary consideration of issues in its PAR and while the project largely meets the relevant criteria and acceptable impact levels, the Department acknowledges that there would be residual social impacts borne by the local community.

The Commission received submissions and heard concerns at the public hearing, which identified the potential for social amenity impacts associated with the project, including but not limited to, impacts relating to air quality, noise, vibration and blasting, GHGE, water resources, biodiversity, and final landform and rehabilitation. Many submissions raised concerns with existing impacts associated with these assessment areas. The Commission has considered potential social impacts and has made recommendations throughout this report relating to the issues and concerns raised at the public hearing and in written submissions.

6.10.3 Voluntary Planning Agreement

The applicant provided an update to the Commission regarding its negotiations with Council regarding the Voluntary Planning Agreement (VPA). Council and the applicant most recently met on 6 February 2018. Discussions have included the distribution of funds to local projects and funds allocated to council-wide projects. The applicant noted that more recently, Council's focus had shifted from a negotiation on contributions based on impact, to a percentage of Capital Investment Value (1%) or a cent per tonne of coal extraction. The applicant made an offer to Council on 5 June 2017 and a revised offer on 6 February 2018.

The Council confirmed that its aim is to focus a percentage of the contributions made, toward the communities that are directly impacted by mining. In addition, the Council confirmed its intention to allocate a portion of any future VPA funds towards creation of the Singleton Economic Development Fund. This is consistent with Council's most recently negotiated VPA for a mining project. Council considers this would assist in its planning and delivery of projects across the local government area.

The Council confirmed that negotiations on the VPA were ongoing and that it was considering the applicant's recent offer.

6.11 Heritage

6.11.1 Aboriginal Heritage

The applicant's EIS was accompanied by an Aboriginal Cultural Heritage Assessment (ACHA) prepared by Australian Cultural Heritage Management, and an Aboriginal Archaeological Values Assessment (AAVA) prepared by Environmental and Heritage Management. The project is situated within the traditional country of the Wonnarua people, the Wanaruah Local Aboriginal Land Council (LALC), and boundaries of Native Title claims by the Plains Clans of the Wonnarua People (PCWP), and the Wonnarua Traditional Custodians (WTC).

The assessments found that while the area surrounding the project is considered of high significance, the site itself and places located within the project area were of low significance. Regardless of this,

the assessment found that the project's impacts would add to the cumulative loss of cultural heritage in the Hunter Valley.

The Department and OEH are satisfied with the findings of both assessments and support the applicant's mitigation and conservation measures for disturbing and salvaging archaeological sites.

6.11.2 Historic Heritage

The EIS included a Historic Heritage Assessment (HHA) prepared by Umwelt. The HHA was undertaken in consultation with the Heritage Division, OEH and community stakeholders, including a fence expert in relation to a Dog-leg Fence in the project area.

The HHA found that while Europeans settled in the area in the early to mid-nineteenth century, no heritage sites or items were listed in the NSW State Heritage Register, State Heritage Inventory, Australian Heritage Database or *Singleton Local Environmental Plan 2013*. Notwithstanding, the HHA found three items within 3 km of the project area. A further 13 potential historical sites or items were identified within or near the project area.

The PAR indicated that the applicant proposes to maintain their existing management measures under the Wambo development and include additional management measures to mitigate impacts in the event of unexpected discovery, in accordance with the relevant policy or guidelines.

The PAR concluded that the potential impacts on historic heritage sites or items would be relatively minor and was satisfied that the impacts would be satisfactorily managed under any conditions of consent.

7. COMMISSION'S CONCLUSION

In response to the Minister's Terms of Reference, the Commission has carefully considered the proposal and the submissions made, including the issues raised in written submissions to the Commission, presentations at the public hearing, the submissions to the Department on the EIS, the RtS and various other documents submitted by the applicant and agencies. The Commission has considered relevant NSW Government Policy in its review of the project.

The Commission has considered the Department's PAR however it notes that the PAR does not represent a full assessment or provide a final position on the issues considered within it. The Commission makes a number of findings and recommendations, seeking further information from both the applicant and the Department, prior to determination.

Having considered the information submitted to date, the Commission's preliminary view is that the project has merit if it can satisfactorily and genuinely address the various recommendations contained within the review report. However, the Commission notes that its views may change on any determination decision, including because of the provision of additional information in response to this review, information provided to the Commission independently of this review, additional matters raised in undertaking its final assessment of the project, or other relevant factors. The Commission also notes that conditions of consent have not formed part of this review and would need to be given detailed consideration at the determination stage.

Gordon Kirkby (Chair)
Member of the Commission

John Hann
Member of the Commission

Tony Pearson
Member of the Commission

APPENDIX 1 – MINISTER'S TERMS OF REFERENCE

Request to the Planning Assessment Commission United Wambo Open Cut Coal Mine Project

Section 23D of the *Environmental Planning and Assessment Act 1979.*
Clauses 268R and 268V of the *Environmental Planning & Assessment Regulation 2000.*

I, the Minister for Planning, request the Planning Assessment Commission to:

1. Carry out a review of the United Wambo Open Cut Coal Mine Project, by:
   a) considering the EIS for the development, the issues raised in submissions, the response to submissions, any other information provided concerning the development by the Applicant and any information provided during the course of the review or as part of the public hearing;
   b) considering the likely economic, environmental and social impacts of the development in the locality, the region and the State;
   c) assessing the merits of the development as a whole, having regard to all relevant NSW Government policies and guidelines; and
   d) providing recommendations on any additional reasonable and feasible measures that could be implemented to avoid, minimise and/or manage the potential impacts of the development;

2. Hold a public hearing during the review as soon as practicable after the Department of Planning and Environment provides its preliminary assessment report to the Commission; and

3. Submit its final report on the review to the Department of Planning and Environment within 12 weeks of receiving the Department's preliminary assessment report, unless otherwise agreed with the Secretary of the Department.

The Hon Anthony Roberts MP
Minister for Planning

Sydney 28/ November 2017

APPENDIX 2 – LIST OF SPEAKERS AT THE PUBLIC HEARING

United Wambo Coal Mine Project (SSD 7142)

Date and Time: Thursday, 8 February 2018 at 10.00am
Place: Civic Centre, 12 Queen Street, Singleton NSW 2330

List of Speakers:

1. Gary Wills (United Wambo)
2. Grace Murphy
3. Georgina Woods (Lock the Gate Alliance)
4. Debbie Pevy
5. Dr John Van Der Kallen (Doctors for the Environment in NSW)
6. Ian Moore – Cancelled
7. Denis Maizey
8. Dr David Paull (Hunter Environment Lobby)
9. Ron Fenwick
10. A/Prof Howard A. Bridgeman (Hunter Communities Network)
11. Steve Wellard

APPENDIX 3 - SUMMARY OF ISSUES FROM ORAL AND WRITTEN SUBMISSIONS

The following points summarise the diverse, and sometimes conflicting, submissions provided to the Commission at the hearing. The summary is not reflective of a prioritisation, sorting or moderation by the Commission in any way. Written submissions can be viewed directly on the Commission's Webpage at: http://ipcn.nsw.gov.au/projects/2017/12/united-wambo-open-cut-coal-mine-project-mod-3-and-mod-16

Noise, blasting, vibration

- Since Wambo commenced mining through the ridgeline, impacts have been more significant.
- Vibration effects from blasting causing houses to shudder and property damage.
- Blasting occurs up to 15 times a week.
- Existing noise from the mine causes sleep disturbance.
- Cumulative noise impacts associated with several mines in the area.
- Concerns raised regarding the 40 dB(A) noise contour, which triggers acquisition rights and the location of properties relative to the 40 dB(A) noise contour.

Biodiversity and rehabilitation

- New biodiversity offset sites secured since EIS and RtS have not been assessed for adequacy or verified by OEH and offset obligations have not been met.
- 250 ha of critically endangered ecological communities (CEECs) will be cleared.
- The Department's report states that OEH is satisfied. The latest correspondence from OEH gives 'conditional acceptance'.
- Concerns raised over use of rehabilitated land towards overall biodiversity credits and risk that the intended extent and quality of rehabilitation will not be achieved.
- No evidence provided that mine rehabilitation land offers suitable, ongoing habitat for threatened species over the life of the mine or after mining activities have ceased. There are no 'like-for-like' offsets.
- Woodland birds rely on fertile valley floor forest for habitat. In the Central Hunter Valley, this is almost gone.
- The Regent Honeyeater, Swift parrot and Spotted-wailed Quoll are listed species that are continually impacted by cumulative habitat loss.
- Impacts on threatened species are not adequately considered in the EIS. The assessment approach has failed to consider landscape connectivity.
- Lack of information on cumulative impacts regarding CEECs.
- The applicant is proceeding notwithstanding that it has a biodiversity credit shortfall.
- Mining inhibits connectivity of vegetation for fauna for the life of the mine.
- The project has not met its requirements under Commonwealth legislation. Approval is required under the EPBC Act.
- Project assessed under the UHSA, however this pathway is not operational. The EIS should have considered the current policies and guidelines.
- Remnant stands of Hunter River Red Gums continue to lose groundwater.

Water resources

- Cumulative impacts are greater than allowed under the NSW Aquifer Interference Policy (NSW AIP).
- Inadequate assessment of groundwater drawdown, particularly cumulative impacts.
- Concerns over the permanent loss of baseflow to Wollombi Brook and the Hunter River and drawdown of associated productive alluvial aquifers.

- Impact on mine owned bores are relevant and should be assessed under the NSW AIP.
- Assessment predicts a 10m drawdown of highly alluvial aquifer, impacting its viability. The Department's assessment minimises the scale of impact.
- Groundwater and surface water modelling is not sufficient. Data gaps are evident that result in uncertainties.
- The regional-scale numerical groundwater model may not be appropriate given the scale of the model.
- Interception of groundwater as a result of mining operations and drawdown in the alluvium that has the potential to impact on GDEs and privately-owned bores.
- Potential for contamination of groundwater and surface water should be considered further.

Air quality

- There are existing dust impacts and concerns were raised that increased heights and volumes of overburden will increase these impacts.
- Concern that impacts are not adequately regulated. The response is always that the mine is operating within its licence.
- Odour emissions from blast plumes are dangerous, create a bad odour and cause respiratory irritation.
- Current management plans commit Wambo to notify locals when air quality criterion are exceeded. Residents do not receive specific notification when this has happened.
- The EIS predicts three exceedances at one resident's property per year, yet the new NEPM provides for no allowable exceedances.
- Prevailing winds from the west significantly impact air quality in the Muswellbrook area.
- The project would increase impacts of climate change. Longer spells of warmer temperatures and dry conditions.
- Increased fire hazards and blasting plumes further impact air quality.
- Significant number of air quality alerts in the past year due to emission exceedances.
- There are new NEPM and EPA standards relevant to PM_{10} and $PM_{2.5}$. The project should be assessed against the new standards. 2025 standards should be considered in the EIS.
- Does 2014 provide an adequate baseline year for modelling? More extensive data set is available.
- Methods used to assess $PM_{2.5}$ are criticised by Ramboll. Background levels are elevated.
- The CALPUFF wind estimates are not verified. CALPUFF should be run in winter and summer.
- Violations of current 24-hour NEPM for PM_{10} and $PM_{2.5}$ at Jerrys Plains will increase due to the project.

Greenhouse gas emissions and climate change

- Greenhouse gas (GHG) emissions are not insignificant. Unless GHG emissions are reduced, increased periods of heat and drought will be experienced.
- The Paris agreement and Commonwealth Government commitment to reduce emissions cannot be met by approving more coal mines.
- It is irresponsible to approve new coal mines in the era of climate change.

Health

- The Department has not applied the cumulative NEPM criteria for $PM_{2.5}$ despite a request from NSW Health that this be done.
- Concerns raised over family health impacts, due to poor air quality and noise impacts.
- Significant recent increase in emergency triage admissions due to respiratory problems.
- Newcastle Health has raised concerns regarding air quality, noise and blasting, and water impacts.

- Areas including Camberwell, Singleton and Muswellbrook have higher effects of poor air quality than other places in Sydney and NSW.
- Psychological impact of mining on the community and concerns over cumulative health impacts.
- Concerns with loss of health of local community and increased hospital admittance.
- Health impacts attributed to existing operations.
- Uncertainties around whether further mines will be approved causes anxiety and stress.

Final voids

- Concerns raised in relation to final voids, including the long terms costs of management.
- Retention of two highly saline voids in the landscape, predicted to be groundwater sinks in perpetuity.
- Cumulative impact of yet another massive void has not been adequately assessed.
- How can the community be assured of any meaningful rehabilitation when there is no Government policy regarding the final voids.

Visual amenity, lighting impacts

- A visual mitigation report was undertaken, which considered visual impacts from one resident's property. The report noted that by the end of 2017, pasture grasses will grow as part of rehabilitation works, addressing impacts associated with the existing Montrose East pit. This has not been the case.
- Existing visual impacts associated with mining the east Montrose pit. Overburden emplacement now visible from properties south of Jerrys Plains.
- Lights from mining operation shine into bedroom window.

Transport impact

- Highway realignment would require closure of the Golden Highway.

Property, voluntary mitigation/acquisition

- Concerns over threshold for triggering voluntary acquisition. Resident concerned regarding location of property within the noise affectation zone, based on noise contour mapping provided to the resident by the applicant.
- Agricultural and horse stud income impacted due to mining.
- Decrease in property prices for those outside the acquisition zone.

Aboriginal heritage

- Adverse effects of the project on Aboriginal heritage, communities and sites.

Inadequate assessment, modelling, baseline data, mitigation, conditions of consent

- The Department does not adequately consider the impact of currently approved mining operations and has not properly addressed cumulative impacts.
- There is a lack of consistency in the assessment of the project across a number of environmental impacts, regarding current, previous and draft policies.
- Grounds for rejection, where mitigation measures would not make the impact acceptable.
- Intergenerational equity not adequately considered in mining projects. Present generation should ensure future generations are protected.
- Conditions of consent are not adhered to for mining projects. Regulator does nothing to enforce consent conditions.
- Objects of the *Environmental Planning and Assessment Act 1979* (EP&A Act) have not been met. Predicted impacts contravene the precautionary principle.
- Indirect and cumulative impacts were inadequately considered.

- Further modelling at a more appropriate scale using contemporary techniques would be beneficial.
- Concerns regarding existing compliance issues have been dismissed and problems trivialised.
- Concerns over the proposed modifications and the overall project will intensify already experienced impacts.

Review process

- Review process removes third party appeal rights, which is of concern given the incomplete nature of the information currently available publicly.
- Request made for Department (including its agencies) officers to attend the hearing and respond to questions from the community, which was denied.
- Lack of confidence in the planning system.
- The Commission's public hearing process is not a genuine form of community consultation.

Social and community

- Loss of social amenity and quality of life due to existing mining operations.
- Concerns over cumulative social impacts, including loss of privately owned land and farming operations has not been assessed.
- Positive contribution that is made to local communities by the mining companies (eg to a local disability provider).
- Local mining companies provide support to community service providers. Donations are made that enable the service providers to continue their work.

Economic

- Net economic benefits are over-estimated, due to a failure to adequately account for environmental costs and reduction in the intergenerational value of natural capital.
- The assessment of new coal projects need to be made in the context of declining global coal demand, consideration needs to be given as to whether this represents any kind of net benefit to the Hunter and the risks it presents.
- The total cost of final voids and the associated impacts need to be properly considered.
- The adopted approach in the economic assessment assumes a linear discount rate of seven per cent. However, the adopted discounted rate should decline over time, considering the long-term time scale of the project's environmental impacts.
- Short-term employment and mining royalties cannot justify impacts of climate change.
- Economic benefits don't take into account health costs and other impacts.
- The project is not justified. Impacts will be significant for minimal economic benefit.
- Mine is a significant local employer. Approval of the joint venture will facilitate ongoing employment opportunities for a further 20 years.
- The project will have direct and indirect economic benefits to the region.
- Approval of the joint venture will give more financial security to families employed directly and indirectly. Benefits will filter through the wider communities.

APPENDIX 4 – RECORDS OF COMMISSION MEETINGS

Notes of Briefing from the Department

This meeting is part of the Review process.		
Meeting note taken by Alana Jelfs	**Date:** 24 January 2018	**Time:** 2pm
Project: United Wambo Open Cut Coal Mine Project		
Meeting place: PAC Office		
Attendees: Commission Members: Gordon Kirkby (Chair), John Hann, Tony Pearson Commission Secretariat: Alana Jelfs (Senior Planning Officer), David Koppers (Team Leader) Department of Planning and Environment: Howard Reed (Director, Resource Assessments), Matthew Sprott (Director – Coordination and Oversight)		
The purpose of the meeting: For the Department to brief the Commission on the project		

The Commission requested that the Department address a number of issues and respond to questions at the briefing. The Department provided an overview of the project and addressed the Commission with responses to questions, a summary of which is provided below:

Mine design/sequence

- *Justification for the selected mine layout.*
  - Based on consideration of the coal resource to be recovered, use of existing infrastructure, mine design alternatives considered, rehabilitation, economics and employment.
  - Varying strip ratios and the amount of overburden to move before mining can occur.
- *Increase in exposed disturbance area for the project?*
  - The project is targeting the same coal seams in both pits (the Arrowfield, Bowfield and Warkworth seams)
  - The project would increase the currently approved disturbance areas by approximately 531 ha.
  - Minor extensions to the Wambo Open Cut Pit account for approximately 3.8 ha of additional disturbance.
  - The new United Open Cut Pit and realigned Golden Highway make up the majority of the remaining disturbance.
- *Why is the floor elevation of the 'United' pit 190m deeper than the Wambo pit?*
  - The target coal seams in the Wambo Pit are located approximately 50m closer to the surface than those in the United Pit (i.e. down to -105 m and -155 m AHD, respectively).
  - The AHD references differ from the stated 190 m variation in the height between the floor of the two final voids.
- *What are the implications for any remaining underground resources, underlying the proposed United pit?*
  - The United underground remains on care and maintenance. United Pit would not sterilise any approved resources.
  - The consent period to extract coal has expired, the consent remains in force for the purposes of rehabilitation, offsets and mine closure.

United Underground Mine

- *What is the status of United's coal transportation rights?*
  - The United consent has expired for the purposes of all coal extraction, processing and transport activities.
  - The consent continues to remain effective in all other respects until the rehabilitation, offset and closure requirements have been satisfactorily addressed.

Mining leases and EPLs

- *Mining leases and EPLs to cover the new joint venture.*
  - A new mining lease is required for an area of the existing A444 lease, which is held by the joint venture.
  - The EPA advised the Department it is satisfied with the Noise Compliance Protocol proposed by the applicant.

Biodiversity

- *Differences between the Upper Hunter Strategic Assessment (UHSA) Interim Policy and the NSW Biodiversity Offsets Policy for Major Projects and associated Framework for Biodiversity Assessment (FBA).*
  - The UHSA is a joint initiative of the NSW and Commonwealth Governments to consider new or expanded coal mines that have the potential to impact on biodiversity in the Upper Hunter Valley.
  - The EIS addressed the requirements of the UHSA on the basis that it would be publicly exhibited and finalised prior to project determination, which has not occurred.
  - The applicant subsequently submitted a Biodiversity Assessment Report (BAR), in accordance with the NSW Framework for Biodiversity Assessment, and the NSW Biodiversity Offsets Policy.
- *Impacted vegetation comprising breeding habitat for the Southern Myotis.*
  - 562 species credits required to account for the proposed clearance of 7.3 ha of potential breeding habitat for the Southern Myotis.
  - The Mangrove biodiversity offset contains suitable roosting habitat for the Southern Myotis.
  - The applicant has identified the quantum of credits required to offset impacts to 7.3 ha, but is yet to confirm how the final credits will be provided.
- *Biodiversity offsets.*
  - The Department would recommend conditions detailing the quantum and extent of credits to be offset for the project, along with requirements for progressive rehabilitation and final rehabilitation objectives.
  - Biodiversity stages account for 82%, 13% and 5% of credits required under the project. To date, 62% of ecosystem and species credits have been located/purchased under the project.
  - The Department considers that the staged approach would enable the applicant to source additional ecosystem and species credits and retire these in a sufficient timeframe.
  - If sufficient credits are not obtained to account for each stage of clearing, the approved stage of clearing would not be able to proceed until sufficient credits can be identified and secured.
- *Groundwater Dependent Ecosystems (GDEs)*
  - The Department of Primary Industries (DPI) Crown Land and Water Division (CLWD) and the Independent Expert Scientific Committee (IESC) recommend development of trigger action plans to manage potential impacts on alluvial aquifers and GDEs.
  - Conditions of consent to monitor and manage potential impacts to GDEs, including adaptive management measures, and application of trigger levels for remedial action and/or offsetting, would be of value.
  - The existing Wambo underground consent contains Subsidence Impact Performance Measures and a condition that if the applicant exceeds performance measures.

Groundwater

- *Groundwater level decline predictions and cumulative impact of drawdown*
  - The PAR shows the predicted groundwater level in the alluvium at GDE1, based on currently approved mining (including the adjacent mines).
  - The Department noted that the groundwater environment has been significantly altered, with some coal seams now proposed for mining already being significantly depressurised.
  - The applicant has sought to minimise impacts on Wollombi Brook and Hunter River alluvium through Project design, including a 370m setback from Wollombi Brook.
- *Can the Department quantify the drawdown in alluvial aquifers along the Hunter River?*
  - Figure 7-2 of the Groundwater Assessment shows drawdown contours in the Quaternary Alluvium adjacent to the Hunter River up to 10m.
  - The most significant modelled drawdowns are predicted to occur east of the United Open Cut along Wollombi Brook and Redbank Creek, and north along the edge of the Hunter River alluvium.

Aboriginal heritage

- The application was publicly exhibited, no submissions were received from identified registered Aboriginal parties.
- Consultation with RAPs was undertaken in the preparation of the Aboriginal Heritage Impact Assessment.
- A report from the Wonnarua Nation Aboriginal Corporation was provided to the Department as part of the EIS.

Environmental management

- *Future environmental management responsibilities given the overlapping mining operations.*
  - Wambo would retain management over its underground operations, coal handling processing plant (CHPP) and rail facilities.

- United would take over management of all aspects of open cut mining and assume management of the Wambo Pit.
- The EPLs would be structured to reflect the project's shared infrastructure with a noise monitoring protocol proposed to the EPA.
- The Department would recommend complex-wide management plans where there are overlapping management systems. This is common practice at other mine sites throughout the Hunter Valley.
- The Commission noted the challenge of identifying which operation is responsible when a non-compliance is reported. This will require detailed consideration ahead of any determination.
- The Commission queried how the Community Consultative Committee (CCC) would be managed for both operations. The Department noted this requires further consideration.

Air quality assessment

- *Explanation of the cumulative air quality assessment undertaken by Ramboll.*
  - The Department engaged Ramboll Environ to undertake an independent technical review of the specialist air quality impact assessments.
  - The review identified inconsistencies between the two assessments, particularly predicted cumulative impacts.
  - The applicant revised its data and remodelled, which provided sufficient certainty to determine the impacts of both proposals. The Department was satisfied with the revised modelling and assessment.

Airblast impacts

- The Blast Impact Assessment indicated that, under worst case circumstances, Receivers 28, 39 and 40 could be expected to exceed a predicted airblast overpressures of up to 114 – 116 dBL.
- The Australian and New Zealand Environmental Conservation Council (ANZECC) Guidelines identify that airblast overpressure levels should be managed to remain below 115 dB(Lin Peak) where possible.
- Management measures have been proposed by the applicant which the Department considers appropriate for managing levels to remain within relevant amenity guidelines for residential receivers.

Noise impacts.

- *Differences in the Project Specific Noise Limits (PSNLs) from the EIS to the PAR.*
  - The Department established PSNLs based on a review of background data provided in the EIS, which more accurately reflect the unique characteristics of the noise environment, including the presence of elevated background levels during the evening and night-time and a more conservative approach to setting baseline levels.
  - The Department applied the precedent set in the recent assessment processes for other mines, and the Industrial Noise Policy's (INP) allowance provisions for atypical areas such that maximum evening and night time Rated Background Levels (RBLs) were set at up to 3 decibel (dB(A)) and 1 dB(A) above measured daytime noise levels, respectively.
- *Clarification on the designation of the project as a "modification or expansion" under the INP.*
  - Noise impacts would be consistent with those associated with an expansion to an existing site.
  - Overall, the predicted noise impacts are considered to be similar in nature to the existing Wambo mine.

Property

- *Current status of any negotiations with impacted private residential landowners.*
  - The Department understands that the applicant has been continuing to liaise with affected landowners throughout the assessment process.
  - Receiver 19 is the only resident that is predicted to be eligible for acquisition or mitigation rights due to air quality impacts under the project and is entitled to acquisition rights under other mining consents.
- *Mine-owned residences.*
  - The Department recommends conditions to manage potential health impacts of tenants who choose to live at these residences, including notifcation of health impacts, allowing tenants to terminate a lease without penalty at any time, and undertake air quality monitoring at impacted residences.

Final landform and rehabilitation

- *Salinity levels and benchmarks.*
  - While no strict threshold exists, consideration of proposed salinity levels is based on the Department's experience of the range of salinity levels that would be expected of a mine of this scale.

- The assessment considers implications of predicted final void salinity levels on potential future land use options.
- The Commission queried the elevated salinity levels presented in the applicant's EIS. These figures were revised and presented in the applicant's September 2017 submission to the Department.

- *Surface area of the two final voids.*
  - The Department noted that the total catchment areas are provided in the RtS.
  - The Department's assessment report did not provide total loss of catchment figures. The Commission requested this information from the Department.
- *Final voids and potential future land use.*
  - The Department considers that the proposed outcomes are acceptable and allow for the establishment of an improved and more naturally sympathetic final landform across the site.
  - The Department considered the additional micro-relief, macro-relief and final void treatments proposed by the applicant and is satisfied that these would deliver acceptable environmental outcomes.
  - The PAR identifies potential opportunities for alternative future lands uses of the voids. Any future uses would be subject to a separate development assessment.

VPA negotiations

- *Status of VPA negotiations.*
  - The Council has verbally advised that its negotiations are ongoing and that it is confident that an appropriate VPA can be agreed with the applicant.
  - The Department does not have information on the quantum of VPA funding or terms being discussed.

*applicant clarified that the project would descend to the Vaux seam.

Outcomes/Agreed Actions: Department to confirm revised total catchment area of final voids

Meeting closed at 5.00pm

Notes of Briefing from the applicant

This meeting is part of the Review process.		
Meeting note taken by Alana Jelfs	**Date:** 7 February 2018	**Time:** 9.00am
Project: United Wambo Open Cut Coal Mine Project		
Meeting place: United Collieries, 134 Jerrys Plains Road, Warkworth 2330		
Attendees: Commission Members: Gordon Kirkby (Chair), John Hann, Tony Pearson Commission Secretariat: Alana Jelfs (Senior Planning Officer), David Koppers (Team Leader) United Wambo: Gary Wills (Glencore), Dave O'Brien (Glencore), Sean Pigott (Glencore), Aislinn Farnon (Glencore), Tim Walls (Glencore), Michael Alexander (Peabody), Steven Peart (Peabody), John Merrell (Umwelt), Kirsty Davies (Umwelt)		
The purpose of the meeting: For the applicant to brief the Commission on the project		

A PowerPoint presentation to the Commission was provided covering the following matters:

History of mining operations

- Mining has occurred at Wambo since 1969 and at United since 1989.
- United commenced with open cut and auger mining operations moving to underground in 1992 after a lease swap with Wambo.
- Wambo has been operating open cut and underground operations since inception with multiple underground targets extracted.
- United ceased underground mining in 2010 and has been on care and maintenance with focus on the joint venture Project.

Joint venture

- 50:50 open cut production operations between United and Wambo signed on 25 November 2014.
- Glencore to manage joint venture, expected commencement in 2018, subject to approvals.
- Wambo-owned coal handling processing plant (CHPP) and train loading facilities will be utilised, with Wambo to remain owner and operator.
- Joint venture excludes Wambo underground operations.
- Maximises resource recovery by stratifying leases and removing surface boundaries.

Project justification

- Brownfield extension recovering an additional 150 million tonnes run-of-mine, generating royalties estimated at $370 million, with a resource recovery to disturbance ratio of 221Kt/ha.
- Continued employment for 250 Wambo employees, creation of 250 mining jobs and a further 120 construction jobs.
- Utilisation of existing Wambo infrastructure, no increase in approved annual throughput of CHPP and rail loop.
- Several mine design and sequencing options were considered for the project. The selected design represents project refinements made during the EIS and RtS phases.

Mine design and sequencing

- Two pits are proposed as Wambo pit is an extension of an existing mining operation, whereas United pit is targeting deeper seams in a new separate mining area – up to 6 km from the existing approved Wambo pit.
- Commencing the United pit in the east ensures no final void near Wollombi Brook and moves operations away from Jerrys Plains.
- Strip ratio is higher in Wambo pit compared to United.
- The applicant considers formation of the joint venture influenced the mine design to maximise resource recovery compared to other options.

- Relevant mining leases A444 and CCL775 contain additional resources not deemed economic due to physical lease constraints and insufficient knowledge of resource.

Air quality

- Air quality monitoring equipment will be strategically located around the operation.
- Monitoring arrangements will allow the joint venture to calculate the site contribution to off-site air quality, without ambiguity, using an upwind and downwind approach in conjunction with met data.
- Exact location of monitors will be discussed with the EPA as a part of the EPL.
- Tenants in mine owned properties would be informed if the project is approved, provided with a dust factsheet and informed of the predicted air quality impacts.
- The applicant has policies and protocols in place to manage impacts on mine owned residences and will work with tenants with potential relocation and no penalty for early contract termination.

Biodiversity

- The project has secured 114% of the CEEC biodiversity offsets.
- 89% of the overall biodiversity offsets secured for stage 1.
- Established 5 land based offset sites, Highfields, Mangrove, Wambo, Jerrys Plains and Brosi.
- Mine rehabilitation contributing to 25% of overall offset requirement.
- Shortfall will be retired either through acquisition of further land and/or payments into the Biodiversity Offset Scheme.
- The applicant presented a report prepared for the NSW Minerals Council which considered the composition and condition of mine rehabilitation against the CEEC at mines, including United. The report found some vegetation conforming to the CEEC at each site.

Final void considerations

- Significant volume of material would be required to fill the voids.
- It would mean disturbing approximately 690 ha of rehabilitated areas.
- Revised total cost to load, haul, dump and rehabilitate is estimated at $630 million, revised from the $430 million presented in the EIS.
- Filling voids would extend noise and dust impacts.

Voluntary Planning Agreement (VPA)

- The applicant met with Singleton Council on eight occasions to discuss the project and the VPA.
- Discussion have included distribution of funds to local projects throughout the local government area.
- Council has shifted focus of the VPA to a percentage of Capital Investment Value (1%) or a cent per tonne of production rate.
- An initial offer was made to Council on 5 June 2017, and a revised offer was made on 6 February 2018.

Property

- A map identifying the properties that have attenuation and those that have existing acquisition rights was presented. The map reflected revised project specific noise levels (PSNLs) and property acquisition and mitigation rights.
- Landholder meetings held with property owners to discuss impacts of mining. The meetings identified some negative impacts but also positive employment benefits, economic contributions of mining companies to the local community,

Environmental management system (EMS)

- EMS will be undertaken using Glencore systems and run as per current operations.
- Real time, monthly and yearly environmental monitoring would be detailed in management plans and implemented and managed by the applicant.
- Community consultation will be continued during the life of the Project to ensure that community concerns are heard and addressed promptly and satisfactorily.

The applicant briefing was followed by an inspection of the site and surrounds.

Documents: The applicant provided a number of site plans, that were used to guide to the site inspection.

Meeting closed at 4.00pm

Notes of Briefing from Singleton Council

This meeting is part of the Review process.		
Meeting note taken by Alana Jelfs	**Date:** 8 February 2018	**Time:** 8.30am
Project: United Wambo Open Cut Coal Mine Project		
Meeting place: Singleton Council, Civic Centre, 12-14 Queen Street, Singleton 2330		
Attendees: Commission Members: Gordon Kirkby (Chair), John Hann, Tony Pearson Commission Secretariat: Alana Jelfs (Senior Planning Officer), David Koppers (Team Leader) Singleton Council: Mary-Anne Crawford (Manager Development and Environmental Services), Jason Linnane (General Manager); Mark Ihlein (Director Planning and Infrastructure)		
The purpose of the meeting: For Council to provide its views on the project to the Commission		

Council raised the following matters:

Final landform and land use outcomes

- Council is concerned with post mining strategic land use outcomes in the region due to legacy of mining, management of rehabilitated land in the future and secured biodiversity offset sites.
- There are a significant number of sites within the local government area that are secured for biodiversity offsets, which limits the potential for future use of these sites, such as agriculture.
- There is limited policy guidance addressing the consequences of mining to assist Council in long-term strategic planning. Council noted the Department's discussion paper 'Improving mine rehabilitation in NSW'.
- Council is keen to see economic and land use diversification post mining and considers there are opportunities to establish different industries in the region.
- Concerns were raised over the number of final voids in the area and adequate consideration for highest and best use.
- Greater consideration is needed for economic diversification of post mining land uses.

Voluntary Planning Agreement (VPA)

- The applicant has made two VPA offers.
- Council's adopted approach is to apply a percentage of Capital Investment Value (1%) or cent per tonne of coal extraction.
- Its aim is to focus a percentage of VPA contributions toward the communities impacted by mining. Council is considering allocating funds for potential community investment projects.
- VPA funds would also be allocated to the Singleton Economic Development Fund to fund future community projects.
- Its approach has been consistently applied for other mining projects. Masterplans can have a valuable role in guiding focus of VPAs.
- Council remains concerned it may not reach agreement on the VPA prior to determination.

Other matters

- Council confirmed that the current Community Consultative Committee (CCC) comprises elected Council members. Council noted the project's CCC should be rationalised with the current CCC and consideration be given to establishing a regional CCC.
- While it does not have a compliance/regulatory role, being at the frontline of community concerns, Council is keen for its officer to understand compliance to assist with conveying information to concerned community members.
- Cumulative impacts & highway deviation.

Documents [tabled at meeting]: The Council tabled correspondence to the applicant, setting out VPA position

Meeting closed at 9.15am