



United Wambo Open Cut Coal Mine

State Significant
Development – Final
Assessment Report
(SSD 7142)



November 2018

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Cover photo

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Glossary

Abbreviation	Definition
Applicant	United Collieries Pty Limited (represented by Glencore), for the United Wambo Joint Venture
BBAM	BioBanking Assessment Methodology
BC Act	<i>Biodiversity Conservation Act 2016</i>
BCA	Building Code of Australia
BCF	Biodiversity Conservation Fund
CCC	Community Consultative Committee
CEEC	Critically endangered ecological community
CHVEFW	Central Hunter Valley Eucalypt Forest and Woodland
CHPP	Coal handling and preparation plant
CIV	Capital Investment Value
Commission	Independent Planning Commission of NSW
Consent	Development Consent
Council	Singleton Council
Department	Department of Planning and Environment
DoEE	Commonwealth Department of Energy and Environment
Dol – L&W	Department of Industry – Lands and Water
DRG	Division of Resources and Geoscience within the Department
EIS	The Environmental Impact Statement prepared for the Project
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development
FBA	NSW Framework for Biodiversity Assessment
Glencore	Glencore Coal Pty Limited, a majority holder of United Collieries Pty Ltd
GDE	Groundwater Dependent Ecosystem
GHGEs	Greenhouse gas emissions
HRSTS	Hunter River Salinity Trading Scheme
HVGC	Hunter Valley Gliding Club
IESC	Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development
INP	<i>NSW Industrial Noise Policy</i>

MERC	Association of Mining and Energy Related Councils
MIA	Mine infrastructure area
Minister	Minister for Planning
MNES	Matters of National Environmental Significance
NPfI	<i>NSW Noise Policy for Industry</i>
NSMC	NSW Minerals Council
OEH	Office of Environment and Heritage
PAR	The Department's preliminary assessment report dated December 2017
Peabody	Peabody Energy Australia Pty Limited, a majority holder of Wambo Coal Pty Ltd
Project	United Wambo Open Cut Coal Mine Project
PRP	Pollution reduction program
RFS	Rural Fire Service
RMS	Roads and Maritime Services
ROM	Run-of-mine
RTS	Response to Submissions, submitted in two parts, Part A in March 2017 and Part B in May 2017
SEPP	State Environmental Planning Policy
SSD	State Significant Development
United Colliery	The former <u>underground</u> mine approved under DA 410-11-2002-I and owned by United Collieries Pty Limited
VLAMP	<i>Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments</i>
VMP	Vibrating wire piezometer
VPA	Voluntary Planning Agreement
Wambo Coal Mine	The open cut and underground coal mine approved under DA 305-7-2003 and owned by Wambo Coal Pty Ltd (a subsidiary of Peabody)
Wambo Train Loading Facility	The train loading facility and associated facilities approved under DA 177-8-2004 and owned by Wambo Coal Pty Ltd (a subsidiary of Peabody)



Executive Summary

The United Wambo Open Cut Coal Mine Project (the Project) proposes to expand and integrate open cut mining operations at the existing Wambo Coal Mine and United Colliery to allow for the extraction of an additional 150 million tonnes of run-of-mine coal over a period of 23 years. The Department of Planning and Environment (the Department) has prepared this final assessment report of the Project for consideration by the Independent Planning Commission of NSW (the Commission). It should be read in conjunction with the Department's preliminary environmental assessment report, dated December 2017.

This report focuses on the 47 recommendations identified in the Commission's *United Wambo Coal Mine Project Review Report*, dated 26 March 2018. The Commission's Review Report found that "the Project has merit, but only if it satisfactorily and genuinely addresses the 47 recommendations contained in the review report". These recommendations include:

- 12 recommendations on noise, vibration and blasting;
- 9 recommendations on air quality;
- 9 recommendations on biodiversity;
- 6 recommendations on final landform and rehabilitation;
- 7 recommendations on water resources;
- 1 recommendation on visual mitigation; and
- 3 recommendations on the transition to the joint venture.

This report sets out the Department's consideration of the Commission's recommendations, the Applicant's response to these recommendations, advice from key Government agencies and advice from an independent air quality expert engaged by the Department.

The Applicant provided a detailed response to the Commission's recommendations on 23 July 2018 that included additional studies and assessment information. In this response, the Applicant clarified the predicted noise, blasting, air quality, biodiversity and water impacts, and the proposed measures to suitably manage, mitigate and offset these impacts. The Applicant undertook further studies to justify the proposed mine plan, final landform and final void design and committed to further refine these designs to facilitate beneficial reuse of the land post mining. The Applicant also clarified how the Project would be implemented and improved the proposed staging and rehabilitation planning for the site.

The Department is satisfied that the Applicant has appropriately implemented or otherwise addressed all of the Commission's recommendations. Based on the Applicant's response, and consultation with key Government agencies, the Department is satisfied that all residual matters have been sufficiently addressed or can otherwise be conditioned, with the exception of finalising the Voluntary Planning Agreement terms with Singleton Council. The Department has engaged an independent development contributions expert to provide advice on this matter and is confident that it can be readily resolved prior to determination.

The Department is satisfied that its recommended conditions provide a comprehensive, contemporary and precautionary approach to the regulation and management of the Project. The conditions would provide a high level of protection for the environment and the health and amenity of the local community and promote the orderly development of the State's significant coal resources.

The Department is satisfied that the benefits of the Project outweigh its residual costs and considers that the Project is in the public interest and is approvable, subject to strict conditions of consent.



Contents

Glossary	iii
Executive Summary	v
1. Introduction	1
1.1 Introduction	1
1.2 Background	1
1.3 Department's Preliminary Assessment Report (PAR)	2
1.4 Overview of the Commission's Review	5
1.5 Applicant's Response to the Commission's Review	6
1.6 Additional Consultation	6
1.7 Chronology	8
1.8 Updated Statutory Considerations	9
1.9 Bilateral Assessment	10
2. Responses to the Commission's Review	10
2.1 Noise, Vibration and Blasting	10
2.2 Air Quality	19
2.3 Biodiversity	27
2.4 Final Landform and Rehabilitation	37
2.5 Water Resources	46
2.6 Visual Impacts	51
2.7 Transition to the Joint Venture	52
3. Other Matters	60
3.1 Planning Agreement	60
4. Recommended Conditions	62
4.1 Project Conditions	63
4.2 Wambo Conditions	63
5. Conclusion	64
6. Recommendation	65
Appendix A – Applicant's Response to the Commission's Review	66
Appendix B – Agency Advice on Applicant's Response Report and Draft Conditions	67
Appendix C – Independent Air Quality Review, Final Comments	68
Appendix D – Updated Statutory Consideration	69
Appendix E – Commonwealth Bilateral Assessment	75
Appendix F – Recommended Conditions	86



1. Introduction

1.1 Introduction

This final assessment report for the United Wambo Open Cut Coal Mine Project (the Project) has been prepared for consideration by the Independent Planning Commission of NSW (the Commission). It should be read in conjunction with the Department's preliminary assessment report (PAR) dated December 2017.

Together, these two reports comprise the Department's environmental assessment of the Project. They have been prepared in accordance with the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and reflect the Commonwealth's accreditation of the State's environmental assessment process.

This report considers the:

- recommendations made in the Commission's *United Wambo Coal Mine Project Review Report*, dated 26 March 2018 (Commission's Review Report);
- the Applicant's response to the Commission's Review Report and additional information provided following the Commission's review;
- further advice from key Government agencies received following the Commission's review; and
- further advice from an independent air quality expert received following the Commission's review.

1.2 Background

United Collieries Pty Ltd (the Applicant), a majority-owned subsidiary of Glencore Coal Pty Limited (Glencore), on behalf of its joint venture with Wambo Coal Pty Ltd, a majority-owned subsidiary of Peabody Energy Australia Limited (Peabody), is seeking approval to expand open cut mining operations at the existing Wambo Coal Mine and United Colliery, to allow for the extraction of an additional 150 million tonnes (Mt) of run-of-mine (ROM) coal over a period of 23 years. The Project is located approximately 16 kilometres (km) west of the township of Singleton, within the Singleton local government area (see **Figure 1**).

The Project comprises two open cut mining components. The first component involves minor extensions to Wambo Coal Mine's existing open cut mining area, including a material increase in the depth of mining to allow for the extraction of deeper coal seams that underlie the approved Montrose Pit (hereafter 'Wambo open cut'). The second component involves the development of a new open cut mining area ('United open cut') on the site of the former United Colliery, an underground mine operating up until 2010 (see **Figure 2**).

The Project would result in the integration of open cut mining operations across the two sites under a single contemporary development consent (SSD 7142). This integration would not occur immediately but would follow a 12 to 15 month transitional period whereby Peabody would continue to operate Wambo open cut until the United open cut is established. This transition is further discussed in **Section 2.7**.

The key aspects of the Project have remained unchanged since the original proposal (see Table 2 of the PAR). These include:

- extending Wambo Coal Mine's existing open cut mining area to facilitate extraction of deeper coal seams;
- developing a new open cut mining area at United Colliery;
- integrating the two open cut operations to extract up to 10 million tonnes per annum (Mtpa) of ROM coal over a 23 year period;

- relocating sections of the Golden Highway, 330 kV and 66 kV transmission lines and telecommunication lines to facilitate mining;
- disturbing 673 hectares (ha) of additional land, including 527 ha of native vegetation;
- transferring ROM coal to Wambo Coal Mine via internal haul roads for processing and rail despatch;
- progressively rehabilitating the site to establish a native woodland dominated final landform that is integrated with surrounding natural landforms and retains two final voids;
- employing 500 full time equivalent personnel (250 existing and 250 additional);
- operating 24 hours a day, 7 days a week;
- involving \$381 million (undiscounted) of capital investment; and
- providing \$414 million (net present value) of economic benefits to NSW, including royalties of \$369 million over the life of the Project.

Two modifications are required to facilitate the Project. Under the joint venture, the Project would utilise Peabody's existing infrastructure such that ROM coal would be transferred via internal haul roads to Wambo Coal Mine (DA 305-7-2003) for processing and then product coal would be transferred via conveyor to the Wambo Train Loading Facility (DA 177-8-2004) for off-site rail despatch. These modifications would also facilitate the smooth transition of management responsibilities of the existing Wambo open cut operations from Peabody to Glencore. Following this transition, Wambo Coal Mine would continue as a solely underground mining operation. The major components of these modifications have remained unchanged since the original proposal. These are:

DA 305-7-2003 MOD 16

- continued operation of Wambo open cut until integrated mining commences by the Applicant under the joint venture;
- continued use of existing mine infrastructure and supporting facilities, including the Wambo coal handling and preparation plant (CHPP) and mine infrastructure area (MIA), and undertaking minor upgrades to these infrastructure;
- extension of operating life to align with the Project;
- approval to receive and process ROM coal from the Project; and
- continued emplacement of reject material within the existing open cut voids.

DA 177-8-2004 MOD 3

- continued use of the existing coal loading and train refueling infrastructure;
- continued transport of 15 Mtpa of product coal;
- extension of operating life to align with the Project;
- approval to receive and transport product coal from the Project; and
- approval to increase daily train movements from six to eight trains per day.

1.3 Department's Preliminary Assessment Report (PAR)

In December 2017, the Department completed its preliminary assessment of the environmental, social and economic aspects of the proposed Project. At that stage, the Department was satisfied that it had sufficient information to determine the likely impacts of the Project and make a preliminary judgement of its relative merits.

Overall, the Department considered that the benefits of the Project would outweigh its costs and that the proposed mine plan struck an appropriate balance between protecting the environment and local community and realising the significant economic benefits of the Project to the region and the State. Consequently, the Department's preliminary findings were that the Project would be expected to deliver a net benefit, was in the public interest and was approvable, subject to strict conditions.



FIGURE 1.2
Regional Context

Figure 1 | Regional context

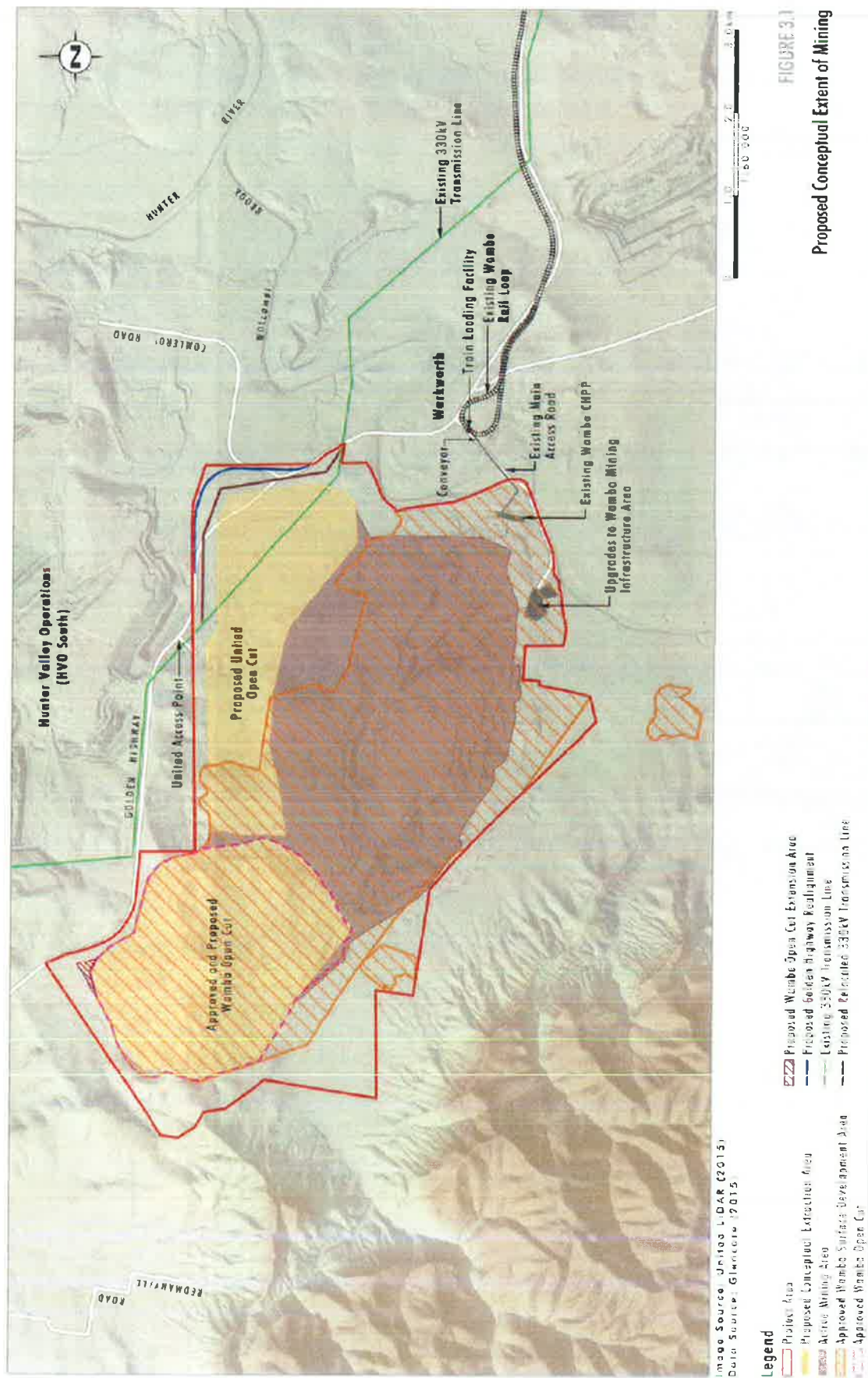


Figure 2 | Proposed project

However, the Department's PAR did identify several matters that required further clarification to strengthen the assessment of the Project, including further information around the biodiversity offset strategy and rehabilitation program. The Department did not expect this information to materially change its preliminary findings, but rather assist in the development of robust and tailored conditions to govern the Project.

1.4 Overview of the Commission's Review

On 28 November 2017, the Minister for Planning requested that the Commission carry out a review of the development application and the associated Wambo modifications, subject to the following terms of reference:

- a) consider the Environmental Impact Statement (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) consider the likely economic, environmental and social impacts of the development in the locality, the region and the State;
- c) assess the merits of the development as a whole, having regard to all relevant NSW Government policies and guidelines; and
- d) provide recommendations on any additional reasonable and feasible measures that could be implemented to avoid, minimise and/or manage the potential impacts of the development.

The Minister also requested that the Commission hold a public hearing during the review. A public hearing was held in Singleton on 8 February 2018, with 12 individuals and special interest groups registering to speak. The Commission also received 24 written submissions following the public hearing.

The Commission's review gave careful consideration to issues raised by the public and key Government agencies at the public hearing and during the review process. The Commission completed its review on 26 March 2018 and its findings were published in the Commission's Review Report.

The Commission agreed that the Project had merit. However, it also identified a range of aspects that remained unresolved and required further assessment or clarification before it could make a final determination. In its Review Report, the Commission made 47 recommendations regarding aspects that warranted additional clarification, further assessment, clearer justification or stronger conditioning to ensure that potential impacts are avoided, minimised and/or mitigated. These included:

- **12 recommendations on noise, vibration and blasting** – regarding the policy setting, road and rail noise, appropriate noise standards, mitigation and acquisition rights, transitional noise criteria, blast management and how the Project should be conditioned;
- **9 recommendations on air quality** – regarding the policy setting, consolidation of previous air quality assessments, consideration of blast fumes, greenhouse gas emissions (GHGs) and diesel emissions, tenancy rights, air quality monitoring and how the Project should be conditioned;
- **9 recommendations on biodiversity** – regarding undertaking pre-clearance surveys, groundwater dependent ecosystem (GDE) monitoring, staging of biodiversity impacts, offset requirements and ecological mine rehabilitation;
- **6 recommendations on final landform and rehabilitation** – regarding alternate landform and rehabilitation options (including backfilled voids), the economic cost of eliminating final voids, consideration of post mining land uses, staging of rehabilitation to align with biodiversity impacts, rehabilitation outcomes and how the Project should be conditioned;
- **7 recommendations on water resources** – regarding final landform surface water catchments, available discharge licenses, cumulative impacts, groundwater monitoring bores, monitoring of

stygo fauna and whether the advice provided by the Independent Expert Scientific Committee on Coal Seam Gas and Large Mining Development (IESC) has been satisfactorily addressed;

- **1 recommendation on visual impacts** – regarding the need for additional visual mitigation measures for nearby private residences, vehicles travelling along the Golden Highway and other sensitive viewpoints; and
- **3 recommendations on the transition to the joint venture** – regarding the need for additional clarity around the triggers, staging and mechanisms for the transfer of responsibility to the joint venture, management of environmental compliance, licensing and other interactions between development consents, community engagement, complex-wide coal production and how the Project should be conditioned.

The Commission acknowledged that the Project would have merit subject to the satisfactory and genuine resolution of these matters. However, the Commission's Review Report clearly emphasised that significant work was required to finalise the assessment and/or conditioning of the residual matters before it could determine the Project. The Commission therefore noted that its view on the Project's merits may change during the determination process, depending on the additional information provided.

Having reviewed the Commission's Review Report, the Department accepts the detailed recommendations and considers that they will assist in ensuring that the determination of the Project is informed by comprehensive assessment material and is based on a fully informed and balanced consideration of the protection of the environment, human health and amenity, and the economic recovery of the State's coal resources.

1.5 Applicant's Response to the Commission's Review

On 23 July 2018, at the request of the Department, the Applicant provided a detailed response to the Commission's Review Report (Applicant's Response Report, **Appendix A**). Following review of the Applicant's Response Report, and additional consultation with key Government agencies, the Department subsequently requested further clarification on the Applicant's Response Report and further information to assist with the developing of conditions of consent. These additional information responses were provided on 11 October 2018 and 17 October 2018 and are also provided in **Appendix A**.

1.5.1 Minor Amendments

The Applicant's Response Report included a minor amendment to the Project boundary and associated schedule of lands following additional survey work. The Department accepts these minor amendments and has reflected them in the recommended conditions of consent (see **Appendix F**).

1.6 Additional Consultation

The Department sought feedback from key Government agencies, including Council, on the Applicant's Response Report and draft conditions of consent. These responses are summarised below.

Council advised that the VPA negotiations were ongoing and that its preference was to resolve the terms prior to the Project being determined. The VPA negotiations are further discussed in **Section 3.1**.

Council also provided comments on final land use opportunities and recommended a condition that would require the Applicant to prepare a final land use strategy in consultation with Council to ensure that the post mining land use is achievable, appropriate and planned well in advance of mine closure. Council also acknowledged that its current strategic land use planning extends to 2041 and therefore any strategy should be adaptive. The Department has incorporated Council's recommendations in the final recommended conditions of consent (see **Appendix F**). The Department's consideration of the final land use opportunities is also set out in **Section 2.4.2**.

The Department's **Division of Resources and Geoscience** (DRG) requested that, should any additional biodiversity offset measures be proposed (both on or off-site), that DRG be consulted to ensure there is no consequent reduction in access to prospective land for mineral exploration, or potential for sterilisation of mineral or extractive resources. Following review of the draft conditions, DRG raised no matters of concern. DRG determined that sustainable, efficient and optimised resource outcomes could be achieved as a result of the Project and that any identified risks or opportunities could be effectively regulated through the conditions of mining authorities issued under the *Mining Act 1992*.

The **Resources Regulator** reviewed the Applicant's Response Report and had no further advice to provide, being satisfied that the mine design represents a reasonable solution within the constraints of the resource and operation. Following review of the draft conditions, the Resources Regulator determined that sustainable rehabilitation outcomes could be achieved as a result of the Project and that any identified risks or opportunities could be effectively regulated through the conditions of mining authorities issued under the *Mining Act 1992*.

Department of Industry – Lands and Water (DoI – L&W), reviewed the Applicant's Response Report and the draft conditions and advised that it had no further advice to provide.

The **Environment Protection Authority** (EPA) raised concern over the Applicant's proposed approach to noise management during the initial transitional period (ie when United open cut commences as a separate operation to Wambo open cut). The EPA was unable to provide conditions until further clarification was provided and it reiterated the need for premise-specific noise criteria to ensure that separate Environment Protection Licences (EPLs) can be appropriately conditioned and regulated. As discussed in **Section 2.1**, the Department later identified appropriate noise criteria for this transitional period. However, in reviewing the draft conditions, the EPA raised further concern that an appropriate compliance methodology had not been developed to distinguish noise from each premise. Without this methodology the EPA considered that it would be unable to effectively regulate noise associated with the development.

In response, the Applicant engaged its noise specialist, Global Acoustics, to prepare a protocol for determining compliance with separate premise-specific criteria. Following review of this protocol, the EPA advised that it supported the proposed noise criteria and recommended that the protocol be further refined prior to commencement of development.

The EPA also provided recommended conditions related to air quality and water management. The Department has incorporated the EPA's recommendations in the final recommended conditions of consent.

The **Office of Environment and Heritage** (OEH) was generally satisfied with the Applicant's responses to the Commission's nine biodiversity-related recommendations. OEH also reviewed the BioBanking Assessment Methodology (BBAM) credit calculations for the two recently identified offset sites (Jerrys Plains and Brosi) and requested that minor adjustments be made. The Applicant provided revised BBAM calculations on 12 September 2018 and OEH confirmed its satisfaction with these calculations on 20 September 2018.

After this advice was provided, the Applicant again revised its credit requirements based on minor adjustments to its disturbance boundaries (see additional information dated 11 October 2018). OEH reviewed these revised BBAM calculations, at the same time as reviewing the draft conditions, and confirmed its satisfaction with the changes.

Following review of the draft conditions, OEH provided recommendations to improve the Aboriginal cultural heritage, threatened biodiversity and flood risk conditions. The Department has incorporated OEH's recommendations in the final recommended conditions of consent. The Department's consideration of biodiversity impacts and the proposed offsets are further considered in **Section 2.3**.

The **Heritage Council** reviewed the draft conditions and requested that more detailed conditions be included to ensure proper management of historic heritage and archaeological values on the site. Heritage Council provided seven recommendations to improve these conditions and the Department has incorporated these in the final recommended conditions of consent.

Roads and Maritime Services (RMS) reviewed the draft conditions and requested that more detailed conditions be included to cover the complexity of the Golden Highway alignment. The Department has incorporated RMS' recommendations in the final recommended conditions of consent.

Rural Fire Service (RFS) reviewed the draft conditions and requested a few minor changes to the proposed Fire Management Plan. The Department has incorporated RFS' recommendations in the final recommended conditions of consent.

Subsidence Advisory NSW and **Transport for NSW** reviewed the draft conditions and had no further comments to provide.

1.7 Chronology

A brief chronology of key consultation events that have occurred since the Department completed its PAR is set out in **Table 1**.

Table 1 | Timeline of key consultation events

Date	Event
12 December 2017	Department's PAR on the Project referred to the Commission
20 December 2017	Commission approves Wambo Coal Mine Modification 17 (DA 305-7-2003 MOD 17)
24 January 2018	Commission briefed by officers from the Department
8 February 2018	Commission held a public hearing in Singleton
26 March 2018	Commission published its Review Report
27 March 2018	Department requested the Applicant provide a response to the Commission's Review Report
23 July 2018	Applicant provided its Response Report to address the Commission's Review Report
25 July 2018	Department sought advice from key agencies on the Applicant's Response Report
31 July 2018	Department sought additional figures from the Applicant to be used in the development consents, including figures that depict the development phases
6 August 2018	Ramboll (independent reviewer) confirmed its satisfaction with the consolidated Air Quality Impact Assessment (AQIA) provided in the Applicant's Response Report
August 2018	Department received comments from Council, DoI – L&W, DRG/ Resources Regulator, EPA and OEH on the Applicant's Response Report
15, 17 and 20 August 2018	Department sought additional information on the proposed highwall/auger mining, transitional noise criteria, the capital investment value and offset credit calculations (at the request of OEH)
23 August 2018	Department provided the Applicant with initial draft conditions of consent (version 1)
12, 17 and 20 September 2018	Applicant responded to the additional information requests, provided feedback on initial draft conditions and provided revised credit requirements based on minor adjustments to its disturbance boundaries

24-25 September 2018	Department sought feedback from key agencies and the Applicant on draft conditions of consent (version 2), and feedback from OEH on the revised credit requirements
October 2018	Agencies and the Applicant provided advice on revised draft conditions of consent, in which both the EPA and OEH were unable to finalise comments without additional information being provided
2, 3, 4 and 16 October 2018	Department sought additional information from the Applicant on rehabilitation responsibilities, noise compliance (at the request of the EPA) and the revised credit requirements (at the request of OEH)
11 and 17 October 2018	Applicant formally responded to all additional information requests
22 and 24 October 2018	Following review of the additional information, OEH and the EPA provided final comments on the proposal and the draft conditions of consent
25 October 2018	Department engaged GLN Planning (independent development contributions expert) to provide advice on the VPA contributions
1 November 2018	Department provided the Applicant with final draft conditions of consent (version 3)
6 November 2018	Applicant accepted the final draft conditions of consent

1.8 Updated Statutory Considerations

1.8.1 Amended EP&A Act

The Department's PAR (Section 4 and Appendix D) included a summary of how the relevant objects of the EP&A Act and the matters for consideration under the then section 79C of the EP&A Act were considered in the assessment of the Project.

The EP&A Act was subsequently amended on 1 March 2018, including amendments to the objects of the EP&A Act and the matters a consent authority must take into consideration when determining development applications (now section 4.15 of the EP&A Act). The Department has therefore updated its statutory considerations in

Appendix D.

1.8.2 Amended Mining SEPP and VLAMP

On 21 September 2018, the matters for consideration under the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (the Mining SEPP) were also amended. These amendments included updating the non-discretionary standards for noise and air quality under clause 12AB to align with the EPA's new policies, the 2016 *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (Approved Methods 2016) and the 2017 *NSW Noise Policy for Industry* (NPfI).

In parallel, clause 12A of the Mining SEPP and the accompanying *Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments* (VLAMP) were revised to reflect these contemporary noise and air quality standards. The VLAMP describes the NSW Government's policy for granting voluntary acquisition and mitigation rights to private properties that are predicted to experience noise and air quality impacts above the non-discretionary standards.

Application of the Mining SEPP amendments and the revised VLAMP apply immediately to all development applications that have been made but not yet determined. This is not an issue for air quality because the Project has already been assessed against the contemporary air quality standards under the Approved Methods 2016. However, for noise, the Project previously fell under the EPA's transitional arrangements for the NPfI which meant that the more stringent noise standards identified under the former 2000 *NSW Industrial Noise Policy* (INP) have continually been applied. Based on the late stage of the assessment, community expectations and the EPA's transitional arrangements, the Department maintains that the noise criteria developed under the INP should

continue to be adopted for the Project and likewise the former VLAMP thresholds for mitigation and acquisition. These policy settings are further discussed in **Section 2**, below.

1.9 Bilateral Assessment

In accordance with the Commonwealth's accreditation of the NSW Government's environmental assessment processes under the EP&A Act, the Department has provided additional information required by the Commonwealth Minister in deciding whether or not to approve the proposal under the EPBC Act in **Appendix E**.



2. Responses to the Commission's Review

The Department has completed its consideration and assessment of residual matters related to the Project, with a specific focus on addressing and responding to the Commission's recommendations. The following sections should be read in conjunction with the PAR. Each of the Commission's recommendations is considered below, with some related recommendations considered collectively to provide a holistic response.

2.1 Noise, Vibration and Blasting

The Commission made twelve recommendations on noise, vibration and blasting impacts. These recommendations relate to the policy setting, road and rail noise, appropriate noise standards, mitigation and acquisition rights, transitional noise criteria, blast management and how the Project should be conditioned.

These recommendations have been considered in detail below.

2.1.1 Policy Setting

Recommendation 1

The Commission finds that the assessment of noise impacts would benefit from the adoption of the NPfl 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 NPfl 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.

Summary of Response

Both the PAR and Commission's Review Report recognise that the Project falls into the EPA's transitional arrangements for noise assessments which seek to ensure an orderly and transparent transition from the INP to the NPfl. Under these transitional arrangements, the Project should be assessed against the former INP.

As introduced in **Section 1.8.2**, the Department considers that the impacts of the Project should continue to be assessed against the former INP, in accordance with transitional arrangements, and as it would result in more conservative noise limits for the Project.

In response to the Commission's Review Report, the Applicant stated that the Noise Impact Assessment (NIA) contained in the EIS was prepared in accordance with the INP which complies with applicable NSW policy settings and allows for the provision of more conservative noise limits at surrounding private receivers. Despite this conclusion, the Applicant provided a comparative assessment of the noise impacts of the Project under the NPfl. This analysis concluded that while there would be no material change in the Project's impacts, the limits that would be imposed under the NPfl would be more relaxed and would reduce the proposed acquisition and mitigation rights for five nearby receivers.

The Department notes that transitional arrangements for the NPfl seek to ensure an orderly and transparent transition from the former 2000 INP to the 2017 NPfl. As the Project falls within these specified transitional requirements, the proposed noise impacts should be assessed under the INP, except for low frequency noise, which must be assessed through the adoption of Section 4 modifying factors in Fact Sheet C of the NPfl.

The Department considers that its assessment of the predicted noise impacts of the Project against the requirements of the INP aligns with the EPA's transitional arrangements and also provides for more conservative noise limits which would protect the amenity and rights of nearby private receivers. The Applicant also accepts continued adherence to the INP.

2.1.2 Road Noise

Recommendation 4

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).

Summary of Response

The Department confirms that many of the predicted heavy vehicle traffic movements to and from the site are to occur in the morning period, while fewer are predicted to occur in the afternoon, when compared to the existing situation. These predicted changes in heavy vehicle movements account for the predicted increase in road traffic noise in the morning period and the minor reduction in road traffic noise in the afternoon.

The NIA contained in the EIS included a traffic noise assessment which predicted the road noise impacts associated with the changes in traffic volumes (light and heavy vehicles) for the Project. The NIA indicated that, at the nine representative locations assessed, the predicted noise levels during the morning period were predicted to increase by 2.7-2.9 dB(A) relative to existing road traffic noise levels, while afternoon traffic noise levels were predicted to reduce by 1.6-1.8 dB(A) in Year 2 and by 0.2-0.6 dB(A) in Year 11 relative to existing road traffic noise levels.

The Applicant's Response Report confirms that the changes in noise levels are due to the heavy vehicle traffic movements being predicted to occur more often in the morning period, while fewer are predicted to occur in the afternoon, when compared to the existing situation. Heavy vehicle volumes east of the Wallaby Scrub Road intersection with the Golden Highway are predicted to increase from 13 to 28 on average during the morning peak hour and decrease from 29 to 14 on average during the afternoon peak hour. Similarly, heavy vehicle volumes west of the Wambo Mine Main Access Road on the Golden Highway are predicted to increase from 13 to 19 on average during the morning peak hour and decrease from 28 to 12 (on average) during the afternoon peak hour.

The Department accepts that these predicted changes in heavy vehicle movements account for the predicted increase in road traffic noise in the morning period and the minor reduction in road traffic noise in the afternoon. The Department also notes that, as acknowledged in the Commission's Review Report, the NIA found that both the predicted morning and afternoon period road traffic noise levels would meet the relevant criteria specified in the *NSW Road Noise Policy*.

2.1.3 Rail Noise

Recommendation 5

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.

Summary of Response

The total required rail movements for the Project and Wambo Coal Mine have been confirmed in the Applicant's Response Report. The Project does not seek to change the approved maximum annual tonnages on the Wambo rail loop. However, the Project seeks approval to increase the maximum daily train movements from 6 to 8 to allow flexibility to match the available time slots on the rail network. These increases in train movements would not change the sound power level and associated LA_{max} pass-by noise levels of the trains servicing the Project or affect the intrusive the $LA_{eq, 15 \text{ minute}}$ noise level calculation.

The Applicant's Response Report confirms the number of rail movements associated with each year of the Project (summarised in **Table 2** below).

Table 2 | Rail movements based on maximum rail haulage production limit of 15 Mtpa

Year	Number of Rail Movements		Total Rail Movements	Average Rail Movements / Day
	Wambo Coal Mine	Project		
5 (2023)	355	682	1037	2.9
10 (2028)	423	671	1097	3.0
15 (2033)	631	502	1133	3.1
20 (2038)	609	441	1050	2.9

It is important to note that the Project does not propose any change to the approved maximum annual tonnages on the Wambo rail loop, which are currently limited to 15 Mt of product coal each year via the Wambo Train Loading Facility consent (DA 177-8-2004). There would therefore be no change to the total number of train movements per year.

However, the Project seeks approval to increase the maximum daily train movements from 6 to 8 to allow flexibility to match the available time slots on the rail network. This would result in total daily train noise also increasing, albeit minimally, on the days when up to 8 train movements occur. However, as there will be no increase in the total annual capacity, any increase in daily movements would be offset by a decrease in daily movements at other times.

Cumulative rail noise generated from the Wambo Train Loading Facility and rail loop have been considered under the operational noise assessment for Wambo Coal Mine. Importantly, the increase in daily train movements would not change the sound power level and associated LA_{max} pass-by noise levels of the trains servicing the Project or affect the intrusive the $LA_{eq, 15 \text{ minute}}$ noise level calculation.

Lastly, the Department notes that rail noise associated with trains travelling along the Mt Thorley Line and Main Northern Rail Line are regulated under ARTC's EPL (EPL 3142). Rail noise associated with the Project is unlikely to increase rail noise impacts on this State rail network.

2.1.4 Revised Project Specific Noise Limits (PSNLs)

Recommendation 2

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

Summary of Response

The Department has used the suggested PSNLs (as revised for Area 5 – Moses Crossing) in its PAR to develop noise criteria for the consents.

In undertaking its preliminary assessment, the Department raised concerns with the conservatism of the datasets used by the Applicant to establish background noise levels in the surrounding receiver areas. In particular, having reviewed these two datasets for the Moses Crossing area, the Department did not consider that the EIS contained sufficient justification for the adoption of the higher long-term background monitoring results and consequently adopted a conservative assessment of the Project's potential noise impacts by developing recommended PSNLs using the lower short-term background monitoring data.

The Applicant has since undertaken additional monitoring at three locations in the Moses Crossing area between 9 March and 3 April 2018. Together these results provide an average rated background level of 35/35/33 dB(A) for the day/evening/night. The Department notes that these results more accurately reflect the long-term monitoring results and has therefore revised the PSNLs to align with the long-term monitoring results. The revised PSNLs are provide in **Table 3**.

Table 3 | Updated PSNLs for SSD 7142

Receiver locations	Measured RBLs (L_{Aeq} , 15min) (day/evening/night)	Adopted RBLs (L_{Aeq} , 15min) (day/evening/night)	Adjusted PSNLs (L_{Aeq} , 15min) (day/evening/night)	Sleep Disturbance (L_{A1} , 1min) (night only)
Area 1 - North Bulga	27 / 28 / 27	30 / 30 / 30	35 / 35 / 35	45
Area 2 - South Wambo	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	36 / 35 / 33	36 / 35 / 33	41 / 40 / 38	48
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

The equivalent PSNLs for Wambo are shown in **Table 4** and remain unchanged from the PAR. The PSNLs in Tables 3 and 4 have been used as the basis for setting noise criteria in the respective consents.

Table 4 | Updated PSNLs for DA 305-7-2003

Receiver locations	Measured RBLs (L_{Aeq} , 15min) (day/evening/night)	Adopted RBLs (L_{Aeq} , 15min) (day/evening/night)	Adjusted PSNLs (L_{Aeq} , 15min) (day/evening/night)	Sleep Disturbance (L_{A1} , 1min) (night only)
Area 3 – Warkworth Village	39 / 39 / 38	39 / 39 / 38	44 / 44 / 43	53
All Other Areas	-	30 / 30 / 30	35 / 35 / 35	45

2.1.5 Exceedances, Mitigation and Acquisition

Recommendation 3

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.

Recommendation 6

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

Recommendation 7

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.

Recommendation 8

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.

Recommendation 9

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

Summary of Response

The Department has updated the PSNLs for the Project and re-assessed the predicted noise impacts of development, by way of compliance with the revised PSNLs. The Project is predicted to exceed the PSNLs at 36 receivers.

The Applicant's Response Report (Appendix 3) also reproduced the predicted 10th percentile noise levels for Wambo Coal Mine incorporating the underground operations, CHPP and Train Loading Facility. These predictions demonstrate that Peabody can achieve the criteria at all but six receivers.

The Applicant provided additional contour maps in its Response Report. However, the Department has relied on the more accurate point data to assess potential impacts for each sensitive receiver. Noise contours are helpful when assessing potential noise impacts on vacant land; however, the Department understands that the accuracy of contours notably diminishes at a scale of 1dB(A).

The Department is satisfied that with this additional information it can confidently identify all potential noise-affected sensitive receivers and allocate appropriate mitigation and acquisition rights in accordance with the VLAMP.

As a consequence of revising the proposed PSNLs for Moses Crossing, there would be changes to the rights afforded to seven receivers under the VLAMP. Specifically, two receivers (R43 and R50c) would move from being afforded acquisition to mitigation and a further five receivers (R44, R50a, R50b, R56 and R133) would no longer be eligible for mitigation.

On the basis of the revised PSNLs, the Project is predicted to exceed the PSNLs at 36 nearby receivers (see **Table 5**). The Department remains satisfied that the Applicant has implemented all reasonable and feasible avoidance and/or mitigation measures to minimise the noise impacts of the development and that these 36 exceedances are acceptable, subject to consideration of voluntary mitigation and acquisition rights under the VLAMP.

These exceedances include negligible exceedances of up to 2 dB(A) at 10 residences in North Bulga, South Wambo, Redmanvale and Moses Crossing. As described in the PAR, the VLAMP identifies that exceedances of this nature would not be discernible to the average person and do not lead to receiver-based treatments.

The majority of remaining exceedances are moderate between 3-5 dB(A) above the PSNLs and trigger the requirement for voluntary mitigation rights at 19 receivers. The Project would also result in significant exceedances

(ie excess of 5 dB(A) above the PSNLs) at seven receivers, triggering the requirement for voluntary acquisition rights.

Table 5 | Changes to exceedances, mitigation and acquisition rights

Exceedance Category	VLAMP Classification	PAR		Final	
		Receivers	Total	Receivers	Total
Negligible (up to 2 dB(A) above PSNL)	Mitigation	R6, R7, R35a, R41a, R46, R379	6	R6, R7, R35a, R41a, R44, R46*, R50a, R50b*, R133*, R379	10
Moderate (3-5 dB(A) above PSNL)		R3, R25, R29, R30, R33, R41b, R42, R44, R48, R49, R50a, R50b, R56, R75, R133, R163, R320, R343, R344, R345, R346, R348	22	R3, R25, R29, R30, R33, R41b, R42, R43^, R48, R49, R50c, R75, R163, R320, R343, R344, R345, R346, R348	19
Significant (excess of 5 dB(A) above PSNL)	Acquisition	R16, R17, R19, R28a, R28b, R39, R40, R43, R50c	9	R16, R17, R19, R28a~, R28b~, R39, R40~	7

* Later clarified to not be a residence and will be excluded from the noise criteria

~ Recently purchased by the Applicant and will therefore be excluded from the noise criteria

^ Applicant requested that acquisition rights be maintained for this residence

The Applicant's Response Report (Appendix 3) reproduced the predicted 10th percentile noise levels for Wambo Coal Mine incorporating the underground operations, CHPP and Train Loading Facility. These predictions demonstrate that Peabody can achieve the PSNLs in **Table 4** at all but six receivers. Three receivers would experience negligible exceedances (R7, R35a and R379), two receivers would experience moderate exceedances and would be afforded mitigation rights (R3 and R25) and the remaining receiver would experience significant exceedances and would be afforded acquisition rights (R19).

The Department has incorporated these voluntary mitigation and acquisition obligations in the recommended conditions of consent.

2.1.6 Transitional Noise (Phase 1)

As discussed in **Section 1.2**, the Applicant is proposing to transition to the joint venture and integrate the Wambo and United open cut operations over a period of 12 to 15 months. The NIAs to date have focused on the noise impacts when the Project is fully operational, and this transitional period has not been fully modelled or assessed. A number of discussions have occurred between the Department, the EPA and the Applicant around the regulation of noise during this transitional phase (Phase 1). The two key issues discussed were identifying appropriate criteria for the separate but neighbouring open cut operations (that would be operated under separate consents and EPLs) and identifying an appropriate compliance protocol to readily distinguish noise emissions from these two separate operations.

NOISE CRITERIA

In its Response Report, the Applicant proposed transitional complex-wide criteria to be imposed across both the consents/EPLs, with limits based on the higher of either the existing Wambo noise criteria or the proposed Project noise criteria. The Applicant stated that this was necessary due to the fact that the existing Wambo open cut is an older mine that has equipment and certain design features that mean it is not possible to immediately operate under the more stringent noise criteria that would apply for the Project.

While the EPA and Department acknowledged the reasoning behind this approach, both agencies raised concerns with the difficulties this posed for conditioning and regulating complex-wide noise across two consents/EPLs, particularly as the sites would be owned and operated by different companies. The EPA stated that

it was essential that the approval contains enforceable site-specific noise conditions that can be applied to each individual EPL and that separate noise level predictions should be provided for each licensed premise.

In absence of these predictions and considering the short duration of this transitional phase, the Department considered the best way forward was to require United open cut operations to comply with the proposed operational noise criteria for the entire duration of the Project (ie during both Phase 1 and Phase 2), and for Wambo Coal Mine to maintain its existing criteria during this transitional phase when its operations continue business as usual.

However, the Project's operational criteria could be argued as being too generous for this transitional phase because only one pit would be in operation (ie the United pit). To address this, the Department considers it appropriate to remove the extra allowance for construction noise that is normally afforded to projects of this type. As discussed in the PAR (Section 6.2.8), the Department initially applied its standard approach to managing short term construction noise for mining proposals. Based on the *Interim Construction Noise Guideline*, this approach requires the combined operational and construction noise of a project to not exceed a level of 5 dB(A) above the recommended operational criteria. This extra allowance is no longer necessary for this Project as the operational criteria includes sufficient capacity to accommodate construction noise.

With regard to the Wambo Coal Mine consent (DA 305-7-2003), the Department has recommended that the existing criteria be maintained for Phase 1, subject to the following suggested improvements:

- the removal of receivers that are now mine-owned;
- updates to the receiver identification numbers to align with SSD 7142; and
- adjustments to the daytime criterion to reflect Departmental practice and community expectations that daytime criteria are not below those applied for the evening/night time (as was discussed in detail in the PAR).

The Department has prepared transitional (Phase 1) noise criteria based on the above approach and has recommended conditions accordingly. Both the Applicant and the EPA have reviewed and accepted these criteria.

NOISE COMPLIANCE PROTOCOL

Following review of the Department's proposed transitional noise criteria, the EPA raised residual concerns that an appropriate compliance methodology had not been developed to distinguish noise from each premise. The EPA advised that unless an appropriate methodology could be identified, it would be unable to effectively regulate noise associated with the development.

While the Department's initial draft conditions included a requirement to develop a noise monitoring protocol within the Noise Management Plan, to distinguish noise emissions between the Project and Wambo Coal Mine, the EPA was not satisfied with deferring the development of this protocol post determination. In response, the Applicant engaged its noise specialist, Global Acoustics, to prepare a protocol for determining compliance with separate premise-specific criteria. This protocol was provided on 17 October 2018.

Both the Department and the EPA recognise that while the differentiation of noise emissions between two neighbouring coal mines is difficult, it is not an uncommon issue for the Hunter Valley. The protocol prepared by Global Acoustics relies on guidance contained in both the INP and NPfI to assess compliance using direct measurement followed by modelling, where necessary. As recognised in the NPfI, professional judgement and monitoring expertise would be required during both steps to determine which source is responsible for the measured levels.

The Department has reviewed the methodology provided and believes that it outlines a clear process by which the Applicant could readily determine compliance. Where a non-compliance is suspected, additional investigation would be required, and the onus would be on the Applicant to show cause as to why a non-compliance should not be recorded.

Following review of this protocol, the EPA recommended conditions to refine the protocol prior to commencement. The Department supports an adaptive approach but maintains that the protocol should be consistent with NPfl guidance and any further refinements could be developed in consultation with the EPA as part of preparing the Noise Management Plan for the Project. Any future protocol should continue to align with current policy and be appropriate for the intended short-term use (ie only 12 to 15 months).

This transitional period is further discussed in **Section 2.7**.

2.1.7 Blast Management

Recommendation 10

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.

Summary of Response

One private residence in Warkworth (R19) is predicted to experience blasting impacts that would exceed the blast criteria. This same residence would be afforded acquisition rights under the Project for both noise and air quality impacts and is already subject to acquisition rights under Wambo Coal Mine, Hunter Valley Operations (HVO) South and Warkworth coal mine development consents.

The Applicant has committed to entering into a negotiated agreement with R19 (if desired by the landowner). Until this agreement is in place, the Applicant would have to adjust blast designs/operations to meet the relevant ground vibration and airblast overpressure criterion. Negotiated agreements between applicants and landowners are a commonly used mitigation mechanism for managing minor exceedances of impact assessment criteria. The Department has recommended conditions that would allow the Applicant to exceed the noise, blast and/or air quality criteria if the exceedances have been agreed with the relevant landowner.

The Applicant's Response Report has outlined the general process for developing a negotiated agreement and the Department notes that the VLAMP provides further guidance on negotiated agreements, albeit from an air quality and noise perspective.

One private residence in Warkworth (R19) is predicted to experience blasting impacts that would exceed the blast criteria. This same residence would be afforded acquisition rights under the Project for both noise and air quality impacts and is already subject to acquisition rights under Wambo Coal Mine, HVO South and Warkworth coal mine development consents.

The Applicant has committed to entering into a negotiated agreement with R19 (if desired by the landowner) as adjusting blast to comply with the relevant criteria at this location could constrain operations. The Applicant's Response Report outlines the general process for developing a negotiated agreement for blasting impacts with a landowner which would include:

- communicating the predicted impacts to the landowner;
- having a suitably qualified person undertake a structural inspection of relevant buildings on the property;
- discussing and agreeing on mitigation measures and/or compensation with the landowner, reflective of the level of impact; and
- finalising in writing the agreements between the Applicant and the landowner.

Until this agreement is in place, the Applicant would have to adjust blast designs/operations to meet the relevant ground vibration and airblast overpressure criterion at R19. Negotiated agreements between applicants and landowners are a commonly used mitigation mechanism for managing minor exceedances of impact assessment criteria. The Department has recommended conditions that would allow the Applicant to exceed the noise, blast and/or air quality criteria if the exceedances have been agreed with the relevant landowner. The VLAMP provides further guidance on negotiated agreements, albeit from an air quality and noise perspective.

Recommendation 11

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.

Summary of Response

The Applicant has committed to implementing blast management controls necessary to meet the relevant criteria for all other private residences. The Applicant's blast management controls were described in the EIS and considered by the Department in the PAR (Section 6.3). Designing blasts to limit ground vibration and blast overpressure is well understood and is used daily by Glencore to manage blast impacts at its other mining operations.

The Applicant has committed to implementing blast management controls necessary to meet the relevant criteria for all other private residences. The Applicant's blast management controls are described in the EIS and the Applicant's Response Report. These include:

- tailoring each blast design to ensure that a suitable maximum charge is selected for each hole;
- reducing the blasting pattern size when close to sensitive receivers;
- using electronic detonators to manage the initiation sequence; and
- undertaking pre-blast meteorological assessments and delay blasts if adverse conditions are identified.

The Applicant has also committed to restricting blasting to a maximum of three blasts per day, 15 blasts per week between 9 am and 5 pm Monday to Saturday. To avoid simultaneous blast events with adjacent mining operations, the Applicant proposes to liaise with these operators to co-ordinate blasts.

Some blast events would occur close to the Golden Highway and HVO South's Riverview Pit. The Applicant has committed to managing blast related closures of the Golden Highway in consultation with RMS and Council so that road closures are kept to a minimum. The Applicant has also committed to consulting with HVO regarding blasting events within 500 m of the Riverview Pit. The Department is satisfied that these commitments appropriately address blast impacts and has recommended similar conditions accordingly.

The Applicant proposes to prepare and implement a Blast Management Plan that would detail blast management measures and monitoring requirements. This plan would include:

- a pre-blast assessment protocol, including meteorological conditions assessment;
- a Road Closure Management Plan that details consultation and road closure processes to manage and minimise Golden Highway road closures;
- flyrock exclusions zones;
- blast fume management (see **Section 2.2.3**);
- a detailed blast monitoring program; and
- blast co-ordination with adjacent mines.

The Department is satisfied that blasting impacts from the Project could be managed through proactive blast design controls and that the recommended conditions of consent would adequately address the Commission's recommendations.

Recommendation 12

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.

Summary of Response

The Applicant's Response Report includes a commitment to undertake structural inspections of buildings within 2 km of Project extraction areas to mitigate blasting impacts. In the recommended conditions, the Department has increased this distance to 3 km.

The Applicant's Response Report included a commitment to offer pre-blasting structural inspections for all privately-owned buildings within 2 km of the Project's extraction areas to establish the baseline condition. Further inspections would then be undertaken at the request of the landowner if any blasting impacts have occurred.

The Applicant's commitment aligns with the Department's standard conditions for minimising potential blast-related structural damage to nearby privately-owned properties. The Department has recommended conditions requiring the Applicant to undertake baseline structural inspections, if requested by any landowner within 3 km of an open cut pit. If the inspection identifies measures that should be implemented to minimise potential blasting impacts, the Applicant would, at the agreement of the landholder, arrange for this work to be undertaken. Further, at any time during mining, if a landowner within 3 km of an open cut pit claims that blasting has damaged a building, the Applicant would be required to investigate this claim, provide the landowner with a copy of the report and, if both parties agree, repair the damage caused. If both parties can't agree on appropriate repairs, the matter would be referred to the Department for resolution.

2.2 Air Quality

The Commission made nine recommendations on air quality impacts. These recommendations relate to the policy setting, consolidation of previous air quality assessments, consideration of blast fumes, GHGs and diesel emissions, tenancy rights, air quality monitoring and how the Project should be conditioned.

These recommendations have been considered in detail below.

2.2.1 Policy Setting

Recommendation 13

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.

Summary of Response

As introduced in **Section 1.8.2**, the Department considers that the impacts of the Project should be assessed against the more conservative and contemporary Approved Methods 2016 that have been developed for the purposes of protecting human health and amenity.

The Applicant provided an updated consolidated Air Quality Impact Assessment (AQIA) in its Response Report (Appendix 7) that has been prepared in accordance with the Approved Methods 2016. The overall findings of this revised AQIA have not materially changed.

In 2015, the National Environment Protection Council (NEPC) approved a variation to the Ambient Air Quality National Environment Protection Measures (NEPM). This variation included new PM_{2.5} criteria for 24-hour and annual averaging periods (25 µg/m³ and 8 µg/m³, respectively) and a lower annual average PM₁₀ criterion (reduced from 30 µg/m³ to 25 µg/m³). While the NEPM provides national guidance on the establishment of air quality standards, each participating jurisdiction is responsible for the application of these standards under its own laws and policies.

In 2016, the NSW EPA updated its 2005 version of the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* to reflect the NEPM air quality standards. The EPA's Approved Methods 2016 was released on 20 January 2017.

In accordance with the EPA's implementation guidance, the Project could be assessed under the former Approved Methods 2005 because the development application for the Project predates 20 January 2017. However, in recognition of the fact that the updated criteria have been developed for the purposes of protecting human health and amenity, and consistent with recent practice, the Department considers that the impacts of the Project should be assessed against the more conservative and contemporary 2016 standards. The Applicant also accepts adherence to these contemporary standards.

As discussed in **Section 2.2.2** below, a consolidated AQIA for the Project was subsequently prepared as part of the Applicant's Response Report (see Appendix 7) based on the Approved Methods 2016. The Department notes that the overall findings of this AQIA did not materially change from the EIS. The Project is not predicted to result in any additional exceedances of the new PM_{2.5} and revised PM₁₀ criteria. As discussed in the PAR, the only private receiver that remains significantly impacted is receiver R19 in Warkworth Village.

With the recent amendments to the Mining SEPP and the release of the revised VLAMP (see **Section 1.8.2**), the Department is satisfied that no additional private receivers would exceed the criteria and that no further mitigation or acquisition rights are required for air quality impacts predicted to be generated by the Project.

The Department recommends that the Project adopt the contemporary air quality criteria and has recommended conditions accordingly.

2.2.2 Updated Air Quality Assessment

Recommendation 14

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

Recommendation 15

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.

Summary of Response

The Applicant has prepared a consolidated AQIA which takes into consideration all air quality related matters that were raised following the submission of the EIS and includes the additional modelling undertaken in response to the Ramboll reviews.

Ramboll has confirmed that all the recommendations of its previous reviews have now been fully considered and adopted.

The Department commissioned Ramboll to undertake a comprehensive independent review of the AQIA in the EIS which identified several uncertainties that required further attention and clarification. At the request of the Department, as part of its RTS, the Applicant provided clarification and specific responses to the issues raised in the Ramboll review.

At approximately the same time, an AQIA for the adjoining HVO South mine was completed for a proposed modification (MOD 5). The Department identified discrepancies between the two air quality predictions. Following identification these discrepancies between the AQIAs and having regard to the concerns expressed by members of the local community, the Department re-commissioned Ramboll to undertake a further independent review of the cumulative air quality impacts in the locality.

A joint cumulative AQIA of the Project and HVO (as proposed to be modified) was subsequently completed (see Appendix E of the PAR) and peer reviewed by Ramboll. This review concluded that the majority of outstanding issues associated with the cumulative AQIA had been addressed. The only remaining issue noted by Ramboll was the lack of a locally-derived background PM_{2.5} data, however it was acknowledged by Ramboll that this matter would not change the ultimate conclusions of the cumulative assessment regarding predicted compliance at sensitive receptors.

In response to the Commission's recommendation, the Applicant prepared a consolidated AQIA which took into consideration all air quality related matters that were raised following the submission of the EIS, including the additional modelling undertaken in response to the Ramboll reviews, and prepared in accordance with the contemporary Approved Methods 2016 (see Appendix 7 of the Applicant's Response Report).

To address Ramboll's residual comment around local PM_{2.5} data, the Applicant has also committed to undertaking PM_{2.5} monitoring as part of the proposed air quality monitoring program for the Project (see **Section 2.2.6**).

On 6 August 2018, following review of the consolidated AQIA, Ramboll confirmed that the additional PM_{2.5} monitoring would address its residual concern and that all the recommendations of previous reviews have now been fully considered and adopted (see **Appendix C**).

The Department confirms that the overall findings of the consolidated AQIA did not materially change from what was presented in the EIS and PAR.

2.2.3 Blast Fumes

Recommendation 16

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.

Summary of Response

The Applicant intends to monitor blast fume via a video recording and analysis system and rate fumes blasts using *Australian Explosives Industry and Safety Group* (AESIG) Visual NO_x Fume Rating Scale.

The Department is satisfied that this approach is currently being effectively implemented at Wambo Coal Mine and at other Glencore mining operations and is satisfied that it is consistent with current industry standards. The Department recommends that a Blast Management Plan be prepared for the Project that includes a requirement for blast fume monitoring.

The Department also supports the Applicant's commitment to complete a trial of emerging blast fume monitoring technology within two years of commencement of mining and, where relevant, to revise the monitoring approach for blast fume at the Project to reflect the outcomes of this trial. The Department has therefore recommended that the Blast Management Plan also incorporates the proposed blast fume trial.

The Applicant's Response Report provides a detailed discussion on how it intends to actively monitor blast fume associated with the Project (see Section 3.2 of the Applicant's Response Report). The Applicant has confirmed that the monitoring program would be developed in consultation with the EPA.

In summary, the Applicant intends to:

- assess meteorological monitoring conditions prior to blasting to avoid blasting in conditions that pose a risk of adverse outcomes;
- video record all blasts to capture the post blast environment;
- analyse the video recordings and rate all blasts using AESIG's Visual NO_x Fume Rating Scale to provide an indication of the concentration of NO_x gases within the post blast fume; and
- if the blast fume is rated a three or above, notify residents of the potential fume event and implement a pollution incident response plan to avoid public exposure to the blast fume.

The Department notes that this proposed approach is currently being effectively implemented at Wambo Coal Mine and at other Glencore mining operations and is satisfied that it is consistent with current industry standards. The Department has recommended blast fume monitoring be included in the Blast Management Plan required to be prepared for the Project.

The Applicant's Response Report provides details of a current trial being undertaken at the Ravensworth Open Cut involving measuring of NO₂ concentrations from blast fume events using drone technology. The key aim of the trial is to provide an understanding of how the fume travels and disperses to allow for improved minimisation of off-site blast fume events. The Applicant has committed to review the outcomes of this trial once complete and implement any outcomes that would improve the Project blast design and/or pre-blast procedures. The Department supports this commitment.

Furthermore, the Applicant has proposed to undertake an assessment and trial of potential methods for non-visual monitoring of blast fume, including the use of fixed and mobile gas monitoring equipment. The Applicant indicates that the trial would assist in determining the feasibility of using monitoring equipment as opposed to using subjective visual categorisations under the Visual NO_x Fume Rating Scale.

The Department agrees that the proposed trial would provide valuable information in relation to the most effective fume monitoring system and has recommended this trial be further detailed in the Blast Management Plan for the Project, including describing how the results would be implemented on the site.

2.2.4 Managing Greenhouse Gas and Diesel Emissions

Recommendation 17

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

Recommendation 18

The Commission finds that deferring pollution reduction measures until such time in the future when a pollution reduction program (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.

Recommendation 19

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.

Summary of Response

The Applicant has committed to implementing specific measures to reduce GHGEs and diesel emissions from the Project.

The Department supports these commitments and is satisfied that the measures would adequately minimise emissions from the Project. The Department is satisfied that the Applicant has explored a wide range of potential GHGE reduction and management measures currently available on the market, including management of fugitive emissions, diesel use efficiency and electricity use efficiency. The Department has recommended conditions requiring the Applicant to continue to take all reasonable steps to improve energy efficiency and reduce GHGEs of the development and to ensure that any new 'non-road' mobile diesel equipment commissioned for the development includes reasonable and feasible diesel emissions reduction technology.

GREENHOUSE GAS EMISSIONS

The Applicant's Response Report provides a comprehensive list of the measures to be implemented to improve energy efficiency and reduce GHGEs (see Section 3.2). In summary, at an operational level, the Applicant has committed to:

- limit the length of haulage routes and associated fuel consumption;
- consider energy and fuel efficiency when selecting new equipment; and
- schedule activities so that equipment and vehicle operation is optimised.

A full and detailed list of the GHGE reduction measures proposed to be implemented is included in Table 3.7 of the Applicant's Response Report. Additional commitments made by the Applicant in relation to managing diesel emissions are described below.

The Department is satisfied that the Applicant has explored a wide range of potential GHGE reduction and management measures currently available, including management of fugitive emissions, diesel use efficiency and electricity use efficiency.

The Department notes that continual improvement in energy efficiency would not only reduce GHGEs, including diesel related emissions, it would also reduce operating costs. It is therefore in the Applicant's interest to continually improve the energy efficiency of its operations based on the best available technology.

The Department has recommended a condition requiring the Applicant to take all reasonable steps to improve energy efficiency and reduce GHGEs.

DIESEL EMISSIONS

The Department notes that the EPA has been investigating opportunities to minimise diesel emissions, including consulting with the mining industry to reduce fine particulate loads generated from non-road diesel emissions. The EPA is particularly concerned that coal mines are a dominant contributor of PM_{2.5} emissions from non-road diesel equipment. To minimise these emissions, the EPA has nominated that all newly commissioned equipment after 30 June 2020 be required to comply with the USA EPA Tier 4 final or equivalent exhaust emission standards.

The Applicant reiterated concerns expressed in its RTS regarding the practicality of sourcing this Tier 4 equipment, as this equipment is not currently commercially available in Australia. Instead, the Applicant committed to:

- purchase all new diesel equipment with an engine capacity of greater than 30 L with the best commercially available emissions technology; and
- purchase new diesel equipment to a Tier 4 standard once it is commercially available in Australia and found to be feasible.

The Applicant indicates that the majority of diesel emissions that would be generated by the Project come from engines with capacities greater than 30 L and that these types of engines would result in between 85-95% of total Project fuel usage.

Based on these figures, the Department considers that application of the best commercially available emissions control technology on this equipment would adequately minimise diesel emissions of the Project. The Department supports the Applicant's further commitment to purchase new Tier 4 equipment when it becomes commercially available.

The Department has therefore recommended a condition requiring the Applicant to ensure that any new 'non-road' mobile diesel equipment commissioned for the development includes reasonable and feasible diesel emissions reduction technology.

In reviewing the draft conditions, the EPA recommended more specific technology requirements based on the USA and European Union policies. The Department supports the EPA's recommendations and its industry-wide approach but notes that the EPA, as the lead NSW Government agency for regulating air pollution, should implement these more specific requirements through conditions on its EPL for the Project.

In response to the EPA's objective of establishing baseline diesel combustion emissions at mine sites and the Commission's similar recommendation for the Project, the Applicant has also committed to:

- estimate the baseline non-road mobile diesel equipment fleet total PM_{2.5} and NO_x (total mass in kg/yr) exhaust emissions and fuel specific (kg/kl fuel) and diesel consumption (kL/year) for the first year of mining operations (ie post construction) to set a baseline for the mining operation;
- estimate the annual non-road mobile diesel equipment fleet total PM_{2.5} and NO_x (total mass in kg/yr) exhaust emissions and fuel specific (kg/kl fuel) and diesel consumption (kL/year) each year for three years using the same guideline used to establish the baseline; and
- report on the outcomes of the above process in the Annual Review.

The Department supports the Applicant's commitment to establish baseline diesel combustion emissions and estimate/report on emissions moving forward but considers there is no need to repeat this commitment in the conditions of consent.

2.2.5 Mine-Owned Residences

Recommendation 20

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.

Summary of Response

The Department has recommended that contemporary conditions be applied to the Project allowing tenants of any mine-owned property that is significantly affected by air quality emissions to terminate their tenancy agreements without penalty at any time.

The Applicant has confirmed that its standard Tenancy Agreement, which would apply to leases for company-owned premises within mining impact areas, allows tenants to vacate penalty free at any time during the tenancy, should they determine that mining impacts are unacceptable.

As discussed in the PAR, it is recognised that the Applicant and other nearby mining companies own and tenant a number of residences in the surrounding area, and that dust levels at 22 of these mine-owned properties would continue to significantly exceed the air quality criteria for the Project. This number increased to 41 mine-owned

properties in the consolidated AQIA due largely to application of the more stringent air quality standards from the Approved Methods 2016.

To address potential health risks associated with elevated dust levels, the Department's standard conditions include requiring applicants to notify landowners and/or tenants of any property that is predicted to be significantly affected by dust about the possible health and amenity impacts of the predicted emissions and provide them a copy of the NSW Health fact sheet entitled "*Mine Dust and You*". The conditions also allow tenants of properties owned by the applicant to terminate their tenancy agreements without penalty at any time and require the applicant to undertake regular air quality monitoring and inform landowners and/or tenants of the likely dust levels at their residence. The Department accepts that these termination rights are only in relation to elevated dust, as these have the potential to cause health related impacts. These standard conditions are currently included in the nearby Wambo Coal Mine, HVO South and Warkworth coal mine development consents.

The Department has recommended that these standard conditions be applied to conditions of consent for this Project. With these measures in place, the Department is satisfied that all current and future tenants would be made aware of the potential health implications of dust generated by the Project and that these issues could be appropriately managed.

The Applicant's Response Report included a copy of its standard Tenancy Agreement which it has confirmed would apply to leases for company-owned premises within mining impact areas of the Project. The agreement includes a condition providing tenants with the option to vacate penalty free at any time during the tenancy should they determine that mining impacts are unacceptable. The standard clause states that the landlord and the tenant agree that "if the tenant has lodged a written complaint with the Landlord about the unacceptable impact of the Mining Operation, the Mining Effects or Other Mining Operations and the Landlord has been unable to resolve that complaint within 14 days, the tenant may terminate the tenancy penalty free anytime during the tenancy with no early termination penalty by giving 14 days' written notice." The Department is satisfied that this clause gives tenants of mine-owned residences the right to terminate their lease at any time.

2.2.6 Air Quality Monitoring Network

Recommendation 21

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.

Summary of Response

The Applicant proposed to supplement the existing real-time meteorological and air quality monitoring network with one new meteorological station and two new PM_{2.5} monitoring units. The Applicant has committed to finalise the monitoring locations in consultation with the EPA.

The Department has recommended conditions requiring the Applicant to operate a comprehensive air quality management system and monitoring program, both of which would be described in the Air Quality Management Plan for the Project.

The Applicant's Response Report provides comprehensive information on the nature and location of the existing and proposed real-time meteorological and air quality monitoring network (see Section 3.2). The network currently includes a combination of dust deposition gauges, total suspended particulate (TSP) and PM₁₀ High Volume Air Samplers (HVAS), continuous PM₁₀ monitoring units (TEOMs) and two proposed continuous PM_{2.5} TEOMs. The Applicant also proposes to install one new meteorological station to the northwest of the site. The proposed location of the monitoring network is included in **Figure 3**. The Applicant has committed to finalise the monitoring locations in consultation with the EPA.



Figure 3 | Proposed air quality monitoring network

The Department is generally satisfied with proposed monitoring network and that it can be further refined post determination. The Department has recommended a condition requiring the Applicant to operate a comprehensive air quality management system that uses a combination of predictive meteorological and air quality forecasting and real-time monitoring to guide the day to day planning of mining operations and the implementation of both proactive and reactive air quality mitigation measures. The air quality management systems and associated monitoring program would be further detailed in an Air Quality Management Plan for the Project. This plan would need to be prepared in consultation with the EPA and approved prior to the commencement of mining operations.

2.3 Biodiversity

The Commission made six recommendations on biodiversity. These recommendations relate to undertaking pre-clearance surveys, GDE monitoring, offset requirements, staging and ecological mine rehabilitation.

These recommendations have been considered in detail below.

2.3.1 Pre-clearance Surveys

Recommendation 22

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

Summary of Response

The Department has recommended a condition requiring the Applicant prepare a Biodiversity Management Plan that includes a requirement to undertake pre-clearance surveys.

As discussed in the PAR (see Section 6.4.2), the Department recommended that the Applicant be required to undertake appropriate pre-clearance surveys prior to vegetation clearing to minimise impacts to fauna and their habitat and to maximise opportunities to salvage tree hollows and translocate threatened flora species. As duly recommended by the Commission, the Department has recommended a condition requiring the Applicant prepare a Biodiversity Management Plan that includes a requirement to undertake pre-clearance surveys.

2.3.2 Groundwater Dependent Ecosystem (GDE) Monitoring

Recommendation 23

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.

Summary of Response

The Applicant has committed to developing and implementing a monitoring program for both GDE1 and GDE2. The Department has recommended that this monitoring program be detailed in a Groundwater Management Plan for the Project and that a further GDE study be undertaken to better understand the characterisation and susceptibility to mining impacts.

As discussed in the PAR (see Section 6.4.2), the Project would have some localised effects on potential GDEs due to cumulative drawdown in the alluvium and shallow overburden. There are two key areas within the zone of cumulative drawdown where GDEs were identified as having the potential to be present. These include GDE1 and GDE2, which are located outside of the Project area, along the riparian corridors of Redbank Creek and Wollombi Brook, respectively.

In the PAR, the Department acknowledged that impacts to both GDEs are likely to be a result of cumulative impacts associated with combined dewatering effects of the Project and other mining operations in the region. These

operations are likely to result in sustained groundwater depressurisation and reduced alluvial recharge rates in the locality for a significant period of time. The Department considered that “it is therefore pertinent to consider the extent and timeframe over which drought-tolerant GDEs can withstand prolonged dewatering and whether the incremental drawdown effects of the Project would augment cumulative drawdown sufficiently to affect the viability or composition of surrounding GDEs” (p. 58 of the PAR).

Consequently, the Department acknowledges that there is some uncertainty around characterisation of these GDEs and how they may be impacted by the Project. The Department has therefore recommended a condition requiring the Applicant to further study GDE1 and GDE2. This study would include further:

- assessment of the hydrological and hydrogeological settings of the site;
- characterisation of the GDE’s and their reliance on surface and groundwater resources;
- identification of potential risks to these GDEs from mining; and
- development of appropriate performance criteria and management measures to ensure negligible environmental consequences.

The Department also considers that the Project would benefit from the adoption of detailed monitoring and response plans to track and manage potential impacts to GDEs as part of the study and over time. The Department considered that predicted impacts on GDEs could be appropriately managed through a comprehensive monitoring regime and adaptive management measures, including specific trigger levels for remedial action and/or offsetting. Similarly, Dol – L&W and the IESC recommended the development of trigger action response plans to manage potential impacts on GDEs.

In the Applicant’s Response Report, it has committed to developing and implementing a monitoring program for both GDE1 and GDE2. The Applicant proposes that the monitoring program would involve monitoring of groundwater levels and the condition of the vegetation before, during and after mining operations. The Department is satisfied with this commitment and has recommended that the Groundwater Management Plan for the Project includes a monitoring regime and performance criteria, including trigger levels for identifying and investigating any direct or indirect impacts on GDEs.

2.3.3 Staging and Offset Requirements

Recommendation 24

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.

Recommendation 25

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.

Recommendation 26

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.

Recommendation 27

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.

Recommendation 28

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.

Summary of Response

The Applicant is seeking to retire its offset credits in three stages, each linked with the progress of mining operations and progressive disturbance of native vegetation. The Applicant has provided details on the Project staging, including accurate mapping of the associated disturbance areas.

The Applicant has confirmed that the total credits required to offset the impacts of the Project include 26,383 ecosystem credits and 562 species credits for the southern myotis (*Myotis macropus*). The credits would be retired in three stages.

The Applicant has identified a majority of the credits required for Stage 1, which equates to 80% of the total biodiversity credit requirements for the Project and the first seven years of disturbance. The Stage 1 Biodiversity Offset Strategy includes five land-based offset sites and 878 ha of 'credit generating' ecological mine rehabilitation, which have the potential to generate 20,165 ecosystem credits and 15 species credits for the southern myotis. The residual 1,281 ecosystem credit requirements for Stage 1 would be secured through other land-based offsets or by making payment into the NSW Government's Biodiversity Conservation Fund (BCF).

OEH has verified the credit requirements for the Project and the potential credits generated from the identified land-based offset sites and ecological mine rehabilitation. The Department and OEH accept the Applicant's proposed staged approach and the Department has recommended conditions requiring the Stage 1 credits to be retired within 12 months of commencing development, and the Stages 2 and 3 credits to be retired prior to commencement of any disturbance associated with these stages.

The Department is satisfied that the Applicant can secure all remaining offsets required for the Project.

BIODIVERSITY OFFSET REQUIREMENT

A Biodiversity Assessment Report, which was prepared in accordance with the *NSW Framework for Biodiversity Assessment* (FBA), was included as part of the Applicant's RTS (Part B). The report included revised calculations of the biodiversity credits required under the FBA to compensate for the impacts of the Project.

In response to recommendations made by OEH and minor refinements to the conceptual disturbance area associated with the Project, the Applicant revised the biodiversity credit requirements in the Applicant's Response Report (Appendix 9 Offset Addendum Report) and again following further refinements to the disturbance areas (see additional information dated 11 October 2018).

The Applicant has confirmed that the following biodiversity credits are required to offset the impacts of the Project:

- 26,383 ecosystem credits for 6 native plant community types occurring within the development footprint including impacts on the *Central Hunter Valley Eucalypt Forest and Woodland* (CHVEFW) critically endangered ecological community (CEEC) under the EPBC Act; and
- 562 species credits for the southern myotis (*Myotis macropus*).

OEH has reviewed the Applicant's BBAM credit calculation report and confirmed that it is satisfied with the biodiversity credit requirements for the Project.

PROJECT STAGING

The Applicant is seeking to retire its offset credits in three stages, each linked with the progress of mining operations and progressive disturbance of native vegetation (NB these stages differ to the development phases discussed in **Section 2.7**, below). The three stages of disturbance are approximately seven-year stages, and generally linked to Project initiation and construction (Stage 1), ongoing mining (Stage 2) and completion of mining and rehabilitation activities (Stage 3). For Stage 1, the Department considers it reasonable to allow 12 months to secure the Stage 1 credits as the Applicant would retire these credits through the use of land-based offsets and the associated BioBanking Agreement (now Biodiversity Stewardship Agreement under the *Biodiversity Conservation*

Act 2016 (BC Act)) can take some months to process. All credits for Stages 2 and 3 would be required to be secured prior to commencement of any disturbance associated with these stages.

The Department is satisfied that this approach provides certainty as the impacts of each stage would be fully offset prior to or soon after the impacts occur, and it incentivises the Applicant to identify necessary credits to ensure the ongoing operation of the mine.

As requested by the Commission, the Applicant's Response Report (as amended 11 October 2018) provides mapping which indicates the extent of the proposed disturbance footprint for each of the three stages (see **Figure 4**). The majority of land disturbance occurs in Stage 1 (85%), meaning that the majority of the biodiversity credits (80%) would be required to be secured early in the Project life. Stage 2 would involve approximately 93 ha of disturbance and 18% of the biodiversity credits, while Stage 3 would involve clearing of the remaining 10 ha of land and 2% of the biodiversity credits.

Table 6 provides the Applicant's approximate timing, disturbance area, associated credit requirements and approximate area of rehabilitation that would occur within each stage. Both the Department and OEH accept the Applicant's staged approach.

Table 6 | Project staging and offsetting requirements

Stage	Timing	Surface Disturbance (ha)	Credits Required		Proposed Rehabilitation Undertaken in Stage (ha)
Stage 1	Years	570	21,446	Ecosystem credits	483 of Woodland
Project initiation including construction activities, development and initial phases of the United open cut	0-7		4,230	Ecological rehabilitation	
			15	Species credits	
Stage 2	Years	93	4,316	Ecosystem credits	677 of Woodland
Ongoing mining operations, rehabilitation activities	8-14		547	Species credits	103 of Agriculture
Stage 3	Years	10	621	Ecosystem credits	1245 of Woodland
Completion of mining operations, rehabilitation activities	15-23				23 of Agriculture
					32 of Riparian

STAGE 1 BIODIVERSITY OFFSET STRATEGY

The Stage 1 Biodiversity Offset Strategy was originally outlined in the Applicant's RTS and later revised in the Applicant's Response Report (Appendix 9 Offset Addendum Report) to include two recently identified offset sites; these being Jerrys Plains and Brosi. This report outlined the methods and results of full BBAM assessments of these sites and how the credits generated by these offset sites contribute to the overall offsetting requirements for the Project.

The credit calculations for Jerrys Plains and Brosi were subsequently refined at the request of OEH and the final credit calculations were provided on 12 September 2018 and OEH confirmed its satisfaction with these calculations on 20 September 2018 (see the Applicant's additional information response dated 11 October 2018).

The Stage 1 Biodiversity Offset Strategy now includes:

- in-perpetuity conservation achieved through the retirement of biodiversity credits through the establishment of five land-based BioBank Sites (now 'Stewardship Sites' under the BC Act): Wambo, Mangrove, Highfields, Jerrys Plains and Brosi; and
- restoration of up to 878 ha of native vegetation communities (including CHVEFW CEEC) as part of ecological mine rehabilitation.

Together these offset areas and rehabilitation have the potential to provide 20,165 ecosystem credits associated with native vegetation communities and generate 15 species credits for the southern myotis. A summary of how the proposed offset package satisfies the Stage 1 offsetting requirements for the Project is provided in **Table 7**. OEH has indicated its satisfaction with the calculations contained in this table. The location of the five land-based offset sites and the conceptual ecological mine rehabilitation area is also shown in **Figure 5**.

Table 7 | Stage 1 Biodiversity Offset Strategy

Impacted Feature	Credits Required (Stage 1)	Offset Sites					Ecological Mine Rehab	Residual Credits Secured Through Other Land-based Offsets or the BCF
		Wambo	Mangrove	Highfields	Jerrys Plains	Brosi		
Central Hunter Valley Eucalypt Forest and Woodland CEEC under the EPBC Act	11,287	3,175	0	0	3,211	2,464	2,437	0
Central Hunter Ironbark - Spotted Gum - Grey Box Forest EEC under the BC Act	1,424	0	0	0	0	656	768	0
Central Hunter Grey Box - Ironbark Woodland EEC under the BC Act	356	0	295	0	31	0	0	30
HU905 - Narrow-leaved Ironbark - Grey Box Grassy Woodland of the Central and Upper Hunter	3,562	0	1,437	0	296	0	1,025	804
HU906 - Bull Oak Grassy Woodland of the Central Hunter Valley	2,973	0	0	2,802	0	13	0	158
HU945 - Swamp Oak - Weeping Grass Grassy Riparian Forest of the Hunter Valley	1,844	0	1,555	0	0	0	0	289
Southern Myotis	15	0	15	0	0	0	0	0
Total Ecosystem Credits	21,446	3,175	3,287	2,802	3,538	3,133	4,230	1,281
Total Species Credits	15	0	15	0	0	0	0	0

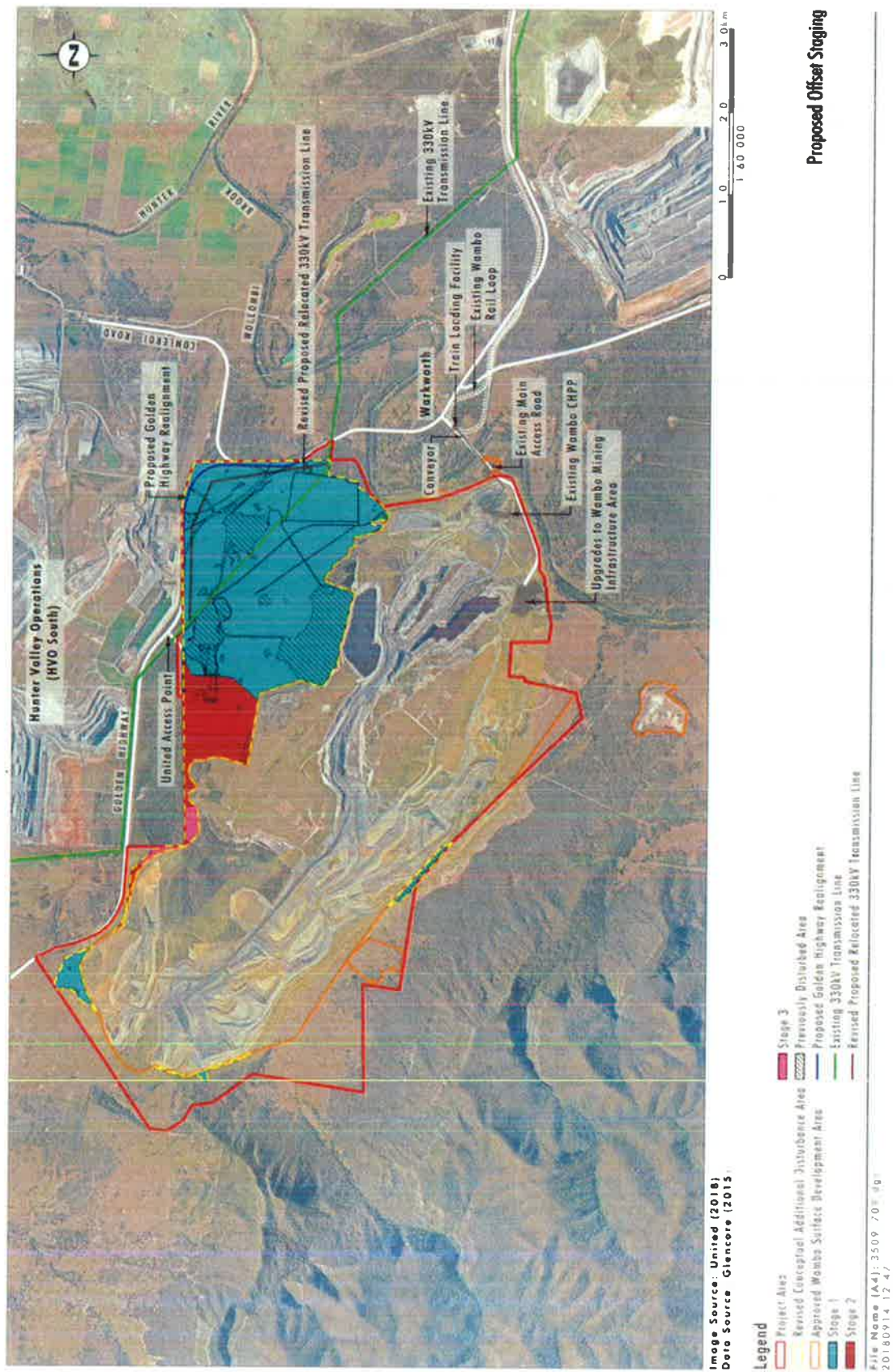


Figure 4 | Proposed staged surface disturbance

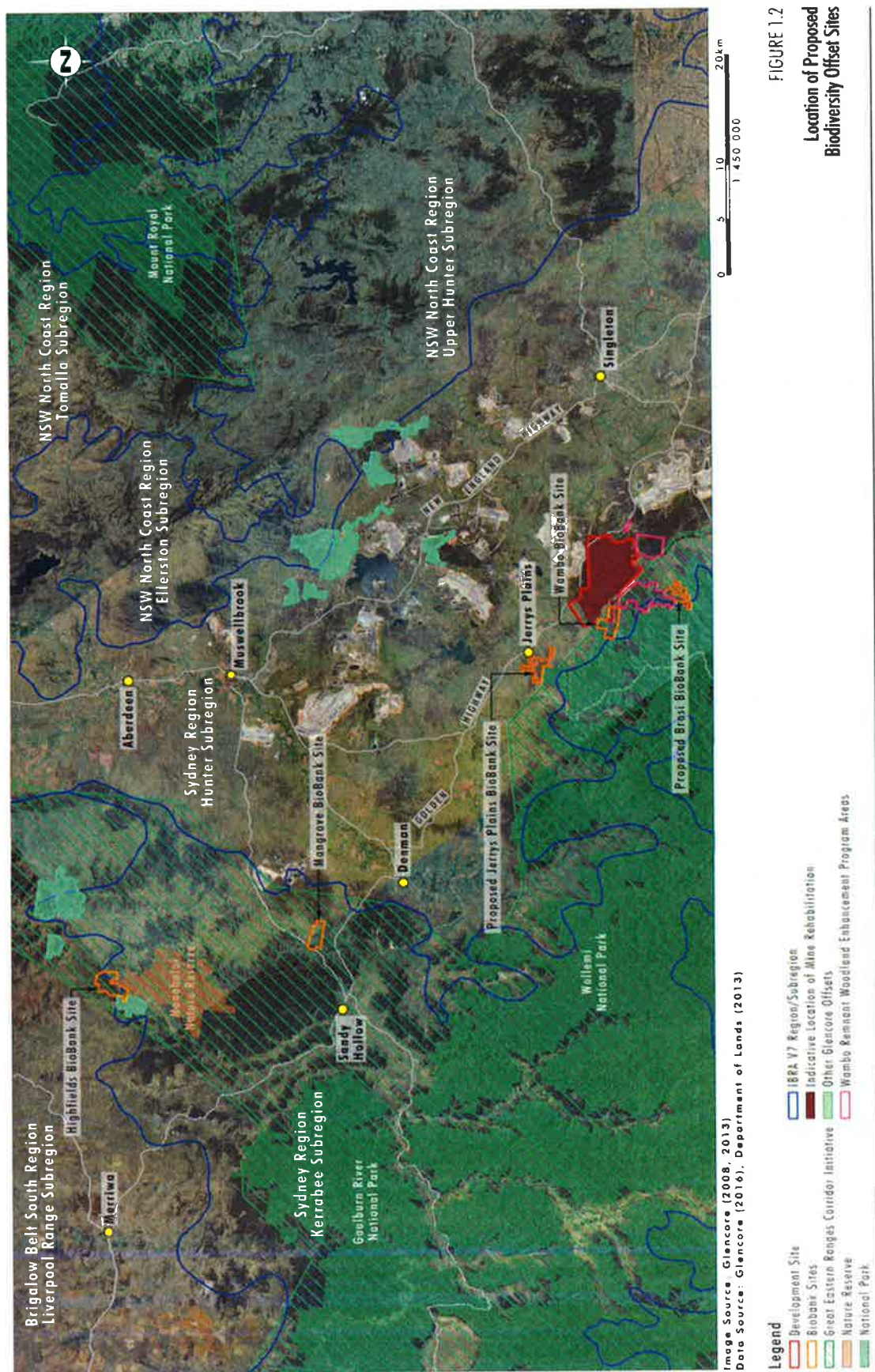


Figure 5 | Location of proposed biodiversity offset sites

As indicated in the last column of **Table 7**, a total of 1,281 biodiversity credits are still required to be secured by the Applicant for Stage 1 of the Project. The Applicant proposes to utilise the options available under the *NSW Biodiversity Offset Policy for Major Projects* (now Biodiversity Offsets Scheme) to satisfy these remaining offset requirements for Stage 1. These are most likely to include other land-based offset sites or payments into the BCF. The Department is satisfied that these residual credits can be readily retired within 12 months of commencement.

The Applicant's additional information response (11 October 2018) also provides a revised summary demonstrating that the proposed Stage 1 Biodiversity Offset Strategy satisfies offsetting requirements for the key matters of national environmental significance (MNES), including the CHVEFW CEEC, Swift Parrot, Regent Honeyeater and Spotted-tailed Quoll (see **Table 8**).

It is important to note that the Commonwealth Government has not accredited the use of the BCF for retirement of credits required for MNES. As shown in **Table 8**, suitable offsets for the MNES for Stage 1 have been identified through land-based offsets. Additional assessment of MNES is provided in **Appendix E** of this report.

Table 8 | Summary of impact and offset areas for MNES

MNES	Impact Area (ha)	Offset Area (ha)	Offset Ratio
Central Hunter Valley Eucalypt Forest and Woodland CEEC	246.8 (known habitat)	1,135.6*	4.6:1
Regent Honeyeater (<i>Anthochaera phrygia</i>)	203.7 (potential habitat)	1,407.3	6.9:1
Swift Parrot (<i>Lathamus discolor</i>)	29.7 (potential habitat)	473.9	16:1
Spotted-tailed Quoll (<i>Dasyurus maculatus maculatus</i>)	352.9 (potential habitat)	1,507.3	4.3:1

*includes areas of mine rehabilitation

The Department understands that the Applicant has undertaken additional consultation with both OEH and DoEE during the preparation of the Stage 1 Biodiversity Offset Strategy. The nature and outcome of this consultation is described in detail in the Applicant's Response Report.

The Department notes that, as the Project is being assessed under the bilateral agreement between the NSW and Commonwealth Governments, the assessment of the Project, including MNES, is being undertaken by the Department and OEH in accordance with the FBA and the *NSW Biodiversity Offset Policy for Major Projects* (now Biodiversity Offsets Scheme). The determination of the EPBC Act Controlled Action approval will then be made after the completion of the NSW approval process.

STAGES 2 AND 3 BIODIVERSITY OFFSET STRATEGY

The Applicant has shown that it has identified suitable offsets (land-based offset sites and ecological mine rehabilitation) to satisfy a majority of the biodiversity credit requirements for Stage 1. The remaining credit requirements for Stages 2 and 3 represent a small percentage of the entire package (20%) and would not be required for 7-14 years.

The Applicant states that based on the offset sites already secured, combined with the option to use the BCF, and Glencore's good track record in securing offsets, it considers that the remaining biodiversity credit requirements for the Project can be readily secured.

The Department is confident that sufficient time and appropriate processes and mechanisms are in place to secure all remaining offsets required for the Project. Further, the Department has recommended a condition requiring the Applicant to retire the Stages 2 and 3 credits prior to commencement of any surface disturbance associated with these stages. The Applicant would also be required to describe how these biodiversity credits will be identified, secured and retired in its Biodiversity Management Plan for the Project and identify potential risks to the successful implementation of the biodiversity offset strategy.

BIODIVERSITY OFFSETS SCHEME

With the commencement of the new BC Act on 25 August 2017, the NSW Government released the new Biodiversity Assessment Method which replaces the BBAM used for this Project. As a result, the credit requirements included above and in the recommended conditions of consent would require conversion to reasonably equivalent biodiversity credits under the BC Act to facilitate retirement under the new legislation. The Department has included a note in the conditions accordingly and understands that OEH has developed a calculator to assist with this conversion.

Similarly, the NSW Government has also released the new Biodiversity Offsets Scheme which essentially replaces the *NSW Biodiversity Offset Policy for Major Projects*. This scheme includes new offset rules to govern the types of offsets that can be used to meet an offset obligation. These include funding a biodiversity conservation action or making a payment into the BCF. With this scheme in place, the Department sees no reason to condition how the Applicant would satisfy its offset obligations other than making reference to this scheme. The Applicant has demonstrated that it can achieve the necessary offset obligations and the Department considers that the biodiversity offset strategy should be adaptive and would therefore be better described in the Biodiversity Management Plan for the Project.

The Department notes that the bilateral agreement between the NSW and Commonwealth Governments has not yet been updated to account for the changes brought forth by the new BC Act. Importantly, DoEE has not endorsed use of the BCF. As such, the Department has included a note in the conditions clarifying that the relevant CEEC credits can only be discharged through payment into the BCF if this fund has been endorsed by the Commonwealth Minister responsible for administering the EPBC Act.

2.3.4 Additional Ecological Mine Rehabilitation

Recommendation 29

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

Summary of Response

Additional area beyond the proposed 878 ha of 'credit-generating' ecological mine rehabilitation is capable of being rehabilitated to an equivalent outcome; however, much of the remaining Project area (1,570 ha) has to be used towards Wambo Coal Mine's existing offset obligation.

The Applicant's Response Report confirms that additional areas beyond the proposed 878 ha of 'credit-generating' ecological mine rehabilitation are capable of being rehabilitated to an equivalent outcome.

The Applicant indicates that the commitment to establish 878 ha of ecological mine rehabilitation was not limited by the capability of the land, rather a commitment to limit the use of rehabilitation as offsets for CEECs at 25% of the total offset requirement. This limit was self-imposed based on consultation with OEH and DoEE regarding the importance of providing a varied offset strategy that incorporates a combination of offset components, including land-based offsets and revegetation programs.

The Department notes that the FBA does not impose a cap on the use of rehabilitation as an offset. However, the Department agrees with the approach taken by the Applicant, recognising the time needed to achieve biodiversity outcomes associated with rehabilitation and the inherent risks of establishing a high-quality, diverse ecosystem on rehabilitated land.

Importantly, there is limited unaccounted for land available within the Project area to establish additional ecological mine rehabilitation (see **Section 2.4.2** below). This is largely due to Wambo Coal Mine's existing obligation to establish 1,570 ha of open woodland on the site. As discussed below, it may be more appropriate to use this residual land for higher order land uses to suit the future needs of the community.

Recommendation 30

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

Summary of Response

The study demonstrates that, with targeted effort, future mine rehabilitation is capable of establishing CHVEFW CEEC. This supports the Applicant's proposal to establish a high-quality ecosystem, which conforms to CHVEFW, using mine rehabilitation.

The Department and OEH have reviewed the report titled 'Assessment of Mine Rehabilitation Against Central Hunter Valley Eucalypt Forest and Woodland CEEC' (Umwelt, 2017), prepared for NSWMC. The report compares the specific key diagnostic characteristics and condition thresholds of the CHVEFW CEEC to existing rehabilitation at four Hunter Valley mine sites: Mount Owen, Mangoola, Mt Thorley Warkworth/Hunter Valley Operations and United.

CHVEFW was listed under the EPBC Act on 7 May 2015 in response to a marked decline in the extent of this community in the Hunter Valley. The report states that "the community is estimated to have once covered approximately 99,000 hectares, whilst its current extent is estimated at 37,000 hectares, constituting a 63% reduction in its area".

Umwelt indicates that the rehabilitation at the four mine sites was not designed to establish CHVEFW or any specific vegetation communities listed as threatened under the BC Act or the EPBC Act. However, the assessment found that some areas of mine rehabilitation at all four sites are now likely to conform to CHVEFW. The report concluded that, with a more targeted effort, future mine rehabilitation across the central Hunter Valley could be established to focus on CHVEFW.

The report also includes recommendations for improving and further enhancing outcomes of mine rehabilitation with regard to establishing the CEEC, including:

- using the four characteristic eucalypt species in the seed mix as the dominant canopy species being established;
- removing contra-indicative species from seed mixes and planting lists, including Red Ironbark (*Eucalyptus fibrosa*), Forest Oak (*Allocasuarina torulosa*) and White Mahogany (*Eucalyptus acmenoides*); and
- undertaking weed control, particularly for perennial species.

The Department considers that this study is encouraging, particularly given that none of the case study mine sites set out to achieve the CHVEFW on mine rehabilitation. The Department notes that the proposed Stage 1 Biodiversity Offset Strategy for the Project requires regeneration of a large area (ie 878 ha) of native vegetation

communities, including 506 ha of CHVEFW. This study demonstrates that the Applicant's proposal to establish this CEEC using mine rehabilitation is achievable. Overall, the Department considers that this study is encouraging and supports the principles of the *NSW Biodiversity Offset Policy for Major Projects*, which allows offset credits to be generated through successful mine site rehabilitation.

OEH advised that it was unable to provide comments on the relevance of the above report without reviewing the supporting data. As such, OEH is unable to form a view on the ability of the Applicant to create CHVEFW in mine rehabilitation areas.

The Department recognises that there is an element of uncertainty around whether CHVEFW can be established through mine site rehabilitation, but that any associated risk can be mitigated. In the event that the rehabilitation does not meet the completion criteria for CHVEFW, the Department has recommended a condition requiring the Applicant to retire relevant deficit biodiversity credits to make up for any shortfall.

As part of its Rehabilitation Management Plan, the Applicant would be required to include a detailed plan for the reinstatement of the proposed ecological mine rehabilitation, including a protocol for progress reviews to demonstrate that the target vegetation communities are on track to being achieved.

2.4 Final Landform and Rehabilitation

The Commission made six recommendations on final landform and rehabilitation. The recommendations relate to alternate landform and rehabilitation options (including backfilled voids), the economic cost of eliminating final voids, consideration of post mining land uses, staging of rehabilitation to align with biodiversity impacts, rehabilitation outcomes and how the Project should be conditioned.

These recommendations have been considered in detail below.

2.4.1 Review of Final Landform Design

Recommendation 31

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.

Recommendation 32

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

Summary of Response

In response to the Commission's Review Report, the Applicant engaged Umwelt to prepare a Concept Mine Plan and Final Void Assessment for the Project that provides a detailed analysis of the beneficial and/or adverse consequences of a range of alternative concept plans, final voids and void water management options.

Umwelt's assessment concluded that a final landform with two final voids remains the Applicant's preferred option. Umwelt states that the key reasons that final voids are proposed to be retained in the final landform are:

- to act as a long-term groundwater sink, capturing salt and avoiding impacts on surrounding water quality; and
- economic constraints that make backfilling the voids economically unfeasible for the Applicant.

The Applicant also engaged Deloitte to prepare a discounted costing evaluation for a final landform that eliminates voids. Deloitte estimates that, in undiscounted terms, the backfilling of the voids would cost \$777 million, inclusive of all costs associated with material movement, rehandling, rehabilitation, drainage infrastructure, maintenance and production staff and overheads. Using the default discount rate of 7%, Deloitte estimates that filling the void would cost \$129 million in present value terms.

The Applicant contends that undertaking the void backfilling would make the Project uneconomic and does not consider that undertaking the works would be a reasonable economic outcome when the cost is compared to the value of the resulting land.

The Department has thoroughly considered the full range of final landform options presented by the Applicant. The Department accepts that maintaining final voids in the final landform would assist in preventing the off-site migration of salt to downstream receiving environments. The Department also accepts that filling of the voids could be prohibitively expensive and would result in up to 6 years of additional impacts to the community.

The Department maintains its view that the two void option is acceptable, and that the proposed final landform would deliver an acceptable environmental outcome. However, the Department supports the Applicant's commitment to investigate options for the management and future use of the final voids and has recommended conditions that reflect these commitments and require the periodic review and optimisation of final void outcomes.

The development of the final landform for the Project has been a long and detailed process that has considered a wide range of options. The Department and several other Government agencies, including DRG, DoI – L&W, OEH and Council, comprehensively considered the initial landform and rehabilitation options presented in the EIS and sought further clarification to address initial concerns regarding the final void design and salinity levels, licensing of water take post mining, land use capabilities, ecological rehabilitation outcomes and post mining beneficial land uses.

In response to these concerns, the Applicant provided additional information in its RTS including a comprehensive review of the mine plan options considered to date and several methods to further optimise and improve the proposed final landform. This review considered the potential environmental effects, construction costs and engineering limitations of various design options, with a particular emphasis on salinity levels, and was accompanied by remodelled predictions of the final void salinity levels for the proposed final landform option. The Applicant used this review to defend its proposal to retain two final voids near the centre of the Project site (based on an estimated cost of \$450 million to backfill these voids) and asserted that the proposed final landform remained the most effective and efficient method of managing void salinity levels and associated environmental effects.

In its PAR, the Department confirmed that “as the final void lakes are now expected to achieve salinity levels typical of other mines in the Hunter Valley, the Department is satisfied that the proposed final landform would deliver an acceptable environmental outcome and assist in preventing the off-site migration of salt to downstream receiving environments” (PAR, p 73). Further, the Department concluded that it “does not consider that any further void treatments or mine plan changes are required at this time and that any further opportunities to optimise the use of final voids can be investigated as the mine progresses and assessed in detail as part of the mine closure process” (PAR, p 73).

In response to the Commission's above recommendations, the Applicant has provided a significant amount of further information regarding the mine design process and final void considerations. The additional information presented in the Applicant's Response Report includes:

- Concept Mine Plan and Final Void Assessment prepared by Umwelt, including a Water Inflow Assessment prepared by Hydro Engineering & Consulting (HEC) (Appendix 10);
- Final Landform Groundwater Modelling Assessment prepared by Australasian Groundwater & Environmental Consultants Pty Ltd (AGE) (Appendix 11); and
- Mine Backfill Cost Report prepared by Deloitte Access Economics (Deloitte), including an independent peer review of the costings undertaken by RPM Global (RPM) (Appendix 12).

The Department notes that much of the consolidated information listed above has been previously presented in various forms as part of the documents submitted throughout the assessment process.

The Concept Mine Plan and Final Void Assessment provides an assessment of the beneficial and/or adverse consequences of a range of alternative concept plans, final void and void water management options. Umwelt indicates that the proposed mine plans and final landform considered a range of factors including maximum resource recovery, optimised operational efficiency, financial viability and economics, technical feasibility, safety, environmental, social and future land use outcomes.

Umwelt's assessment concluded that a final landform with two final voids remains the Applicant's preferred option. Umwelt states that the key reasons that final voids are proposed to be retained in the final landform are:

- to act as a long-term groundwater sink, capturing salt and avoiding impacts on surrounding water quality; and
- economic constraints that make backfilling the voids economically unfeasible for the Applicant.

In reaching this conclusion, Umwelt emphasised that the currently approved final landform for Wambo Coal Mine already includes two final voids and that while the Project would relocate the final voids to the northeast, increase their size and change their design to integrate with the surrounding landforms, the number of voids would remain the same. **Figure 6** provides a comparison of the approved and proposed final voids. However, the Department notes that the blue 'final void' areas in the two figures are not readily comparable as the areas shown in the right-hand figure are the smaller pit lakes.

Umwelt notes that a key benefit of leaving final voids in the final landform is to create pit lakes that act as long-term salinity sinks. The voids would be positioned below the water table, allowing poor quality water from the coal seam aquifers and other fractured rock aquifers to flow into the voids. The evaporation from the pit lakes would minimise long-term surface water and groundwater impacts by capturing saline water on the site.

Umwelt assessed other water management options to reduce salinity levels in the final voids. One option that Umwelt considered potentially feasible was the creation of a spill and fill scenario for the United final void by increasing its catchment areas and constructing a flood channel to direct flood flows from Wollombi Brook into the void. This fill and spill scenario would allow for the periodic influx of low salinity flood water into the pit lake, diluting the pit lake salinity levels and improving water quality, making it available for a wider range of uses (eg recreation, aquaculture, etc). The Applicant committed to further investigate this option as part of the detailed final landform design and final void strategy for the Project. However, the Department considers that this option is unlikely to be viable as it could have unintended implications for surface water take in the final landform, long term water balances of the final voids and water quality implications for downstream receiving environments.

NO FINAL VOIDS OPTION

In response to the Commission's recommendations, the Applicant also engaged Deloitte to prepare a further discounted costing evaluation for a final landform that eliminates voids. Deloitte estimated that backfilling both final voids would cost \$777 million, in undiscounted terms. This revised costing is significantly higher than Glencore's previous \$450 million estimate and is inclusive of all costs associated with material movement, rehandling, rehabilitation, drainage infrastructure, maintenance and production staff and overheads. However, as the majority of modelled backfilling activities would occur following the cessation of mining (ie from 2041 rather than in parallel to mining operations), the present value cost of backfilling is significantly lower. Using the default discount rate of 7%, Deloitte estimate that filling the void would cost \$129 million in present value terms. The applied discount rate of 7% is in line with the Department's *Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals* (2015).



Legend
 Project Area Boundary
 Approved Wambo Surface Development Area
 Rehabilitation
 Final Void
 Dam
 Image Source: United (2018)
 Data Source: United (2018)

FIGURE 4.2
Changes in Final Voids
within Project

Figure 6 | Proposed changes in final voids

Further to this, the Applicant has argued that the open market does not support the reinstatement of additional backfilled land, as the price per hectare of similar land on the open market is significantly cheaper than the undiscounted cost for each additional hectare created by backfilling both final voids. The Department questions why this comparison was not undertaken in present value terms but accepts that the cost to the Applicant of reinstating additional land is likely to be more than the economic value of the resulting land.

The Applicant has also indicated that backfilling the voids would not only make the Project uneconomic but would extend the life of the Project by a further 6 years, with associated prolonging of environmental and amenity impacts, monitoring and delayed rehabilitation. On this basis, the Applicant contends that it would not be reasonable or feasible to require backfilling of the final voids as part of any development consent for the Project.

ONE VOID OPTION

The Department has thoroughly considered the full range of final landform options presented by the Applicant. The Department accepts that maintaining at least one final void in the final landform would assist in preventing the off-site migration of salt to downstream receiving environments. The Department also accepts that the expense of filling of one or both voids could be disproportionate to the benefits gained and would prolong impacts to the community, albeit within the amenity levels assessed as being acceptable for the operational phase of the Project.

As discussed in its PAR, the Department supports the development of appropriate final landforms that improve landform functionality, visually integrate with the surrounding natural environment, minimise the size and scale of any necessary final voids and reinstate future productive land uses. The Department accepts that backfilling both final voids would not provide the optimal outcome for the Project, in part due to the high economic cost of undertaking this work, but more significantly due to the function of the final voids as a groundwater sink to capture saline water on site and mitigate downstream effects on the environment.

The Applicant's Response Report included a high level consideration of two different single void options. Under the first option, the Applicant would completely backfill the Wambo void to free drain to North Wambo Creek and reinstate the 24 ha pit lake to provide future productive land, at an undiscounted cost of \$176 million. Under the second option, the Applicant would completely backfill the United void to free drain to Wollombi Brook and reinstate the 87 ha pit lake to provide future productive land, at an undiscounted cost of \$571 million. The Applicant also identified that the removal of groundwater drawdown associated with the second option would increase salinity impacts on Wollombi Brook.

CONSOLIDATED VOID OPTION

In addition to these options, the Applicant acknowledged the potential to consolidate the two voids through the construction of a pipeline/channel or by continuing mining operations to remove intervening overburden material. While the Applicant did not provide detailed cost estimates for this option, it strongly deemed this option to be uneconomic given the substantial volume of material that would need to be handled. In light of these arguments, the Applicant has asserted that backfilling even one void would be impractical, jeopardising the Project economics and delivering limited benefits, which it does not consider warrant the additional costs to the Project.

Given the salinity levels of the proposed Wambo and United pit lakes are now relatively similar to other final voids in the Hunter Valley (at 17,000 mg/L and 13,000 mg/L respectively) the Department accepts that the relative environmental benefits of consolidating the two pit lakes to dilute the salinity concentrations of the Wambo void are less significant than they were for the original EIS mine design. Nevertheless, the Department maintains that there are still opportunities to review the final void designs as the Project progresses, with the aim of minimising to the greatest extent practicable the size, scale and number of final voids to be left post-mining.

CONSIDERATION

The Department maintains the view expressed in its PAR, that the retention of two final voids is an acceptable option and that the improved landform variability, visual relief, functionality and rehabilitation requirements would deliver an acceptable environmental outcome that improves upon the landform currently approved at Wambo Coal Mine. The Department also supports the Applicant's commitment to investigate options for the continual refinement of the design and management of the final voids and considers that the two void design at present provides a sound basis for achieving these landforms.

The Department considers that any further opportunities to optimise void treatments or amend surface water drainage between the voids can also be investigated as the mine progresses. To reflect this, the Department has included a condition requiring the Applicant to periodically review and refine the final landform and final void outcomes. This review should critically analyse the staged mine plans over the remaining mine life to ascertain potential opportunities to consolidate the pit lakes associated with the two open cut voids, and maximise to the greatest extent practicable, opportunities for the beneficial reuse of any residual final void catchment areas and pit lakes following the cessation of mining. The Department considers that any potential improvements in the final void designs and land use outcomes must be managed through the development consent and would be most suitably addressed by updating the Rehabilitation Strategy for the Project. The Department has reflected this in the recommended conditions.

2.4.2 Post Mining Land Uses

Recommendation 33

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 with Council as part of this process.

Summary of Response

The Applicant has identified several viable final land use options that it considers are compatible with the proposed native vegetation/conservation and agricultural land uses. These include industrial uses, adventure tourism and recreation, aquaculture and pumped-storage hydroelectricity.

The Applicant has committed to undertaking further investigations of potential post mining land uses and preparing a Final Land Use Strategy in consultation with Council. The Department and Council support this approach.

The Applicant's Response Report provides detailed consideration of feasible final land use options that builds on the information provided in the EIS. As recommended by the Commission, the Applicant met with Council to discuss these options.

The Applicant indicates that the primary final land use would be native woodland/conservation to satisfy previous and future offset obligations. This land use would cover 2,448 ha, approximately 80% of the Project area, comprising of Wambo Coal Mine's existing requirement to establish 1,570 ha of open woodland revegetation and this Project's proposal to establish a further 878 ha ecological mine rehabilitation (see **Figure 7**). In response to community feedback, the Applicant has also committed to reinstating 125 ha of agricultural land. These requirements/commitments limit the area available for other post mining land uses.

Nevertheless, the Applicant's Response Report has identified several viable ancillary land use options for the remaining land that it considers are compatible with the proposed native vegetation/conservation and agricultural land uses.

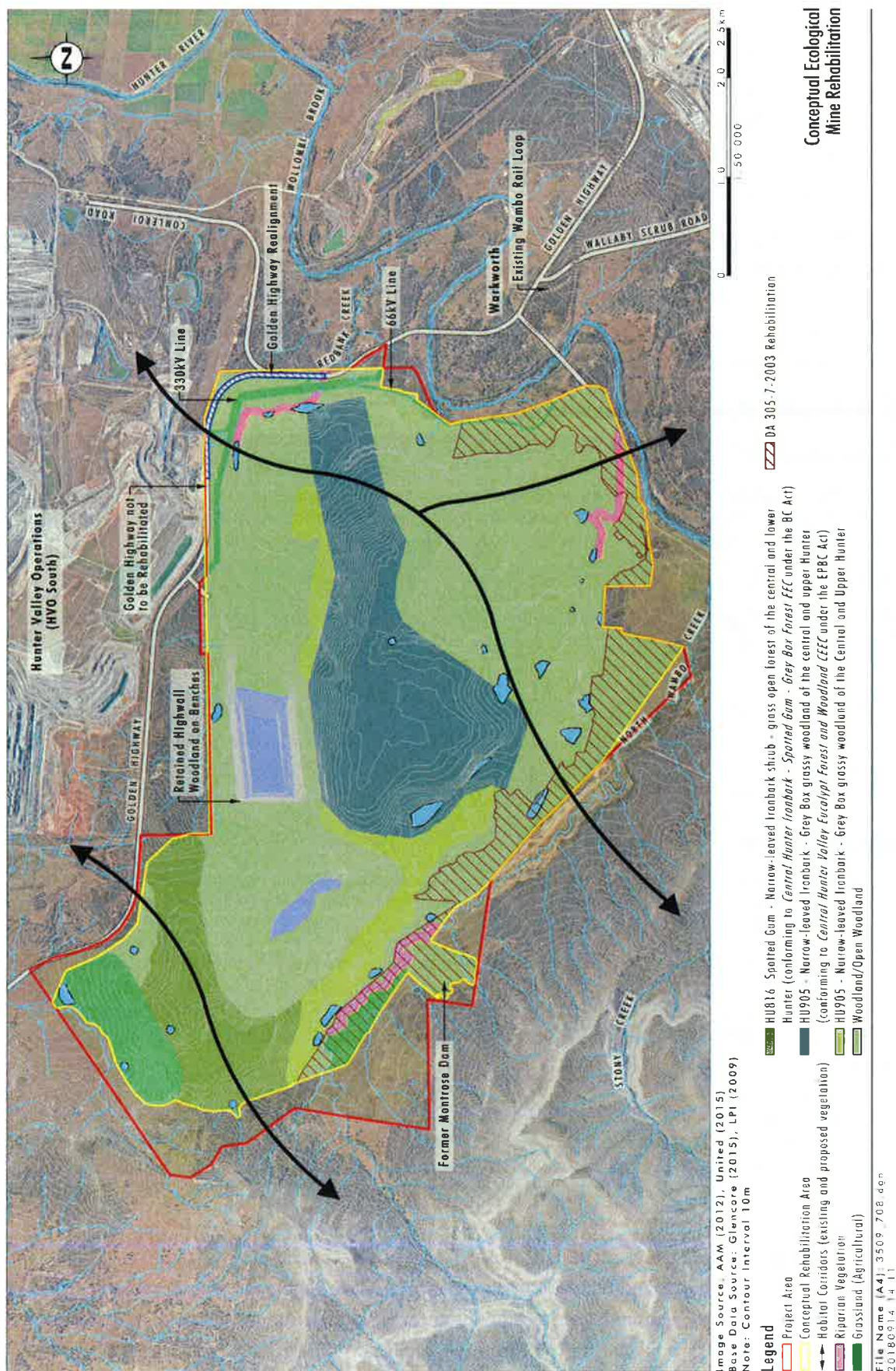


Figure 7 | Conceptual ecological mine rehabilitation

These land use outcomes include:

- industrial uses, particularly considering of the availability of the rail loop, as well as the suitability of infrastructure associated with the workshop, office complex and other surface facilities;
- adventure tourism and recreational uses, through the incorporation of trails, picnic areas and potential introduction of fish stock in the final pit lake for recreational fishing;
- aquaculture; and
- pumped-storage hydroelectricity.

The Applicant has committed to undertaking further investigations of potential ancillary land uses and preparing a Final Land Use Strategy in consultation with Council. The Department supports this adaptive approach as it is difficult to predict future land use demands and community needs beyond 20 years. The Department considers that this Final Land Use Strategy would be best placed in a Mine Closure Plan, prepared at least five years prior to closure and has recommend a condition accordingly.

2.4.3 Rehabilitation Outcomes and Conditions

Recommendation 34

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.

Recommendation 35

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.

Recommendation 36

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.

Summary of Response

The Applicant has proposed to undertake 878 ha of ecological mine rehabilitation to receive 4,230 upfront ecosystem credits under the FBA. This means that all of the ecological mine rehabilitation credits generated by the Project can be retired prior to the commencement of Stage 1 of the Project.

To demonstrate the ability of mine site rehabilitation to achieve ecological outcomes, the Applicant has provided information on the success of other rehabilitation programs (including for the re-establishment of listed threatened communities) being implemented at other Glencore sites. The Applicant has advised that these other programs have been used as a basis for the development of its proposed rehabilitation strategy for the Project.

The Department confirms that the ecological mine rehabilitation would be subject to a rigorous regulatory framework which has a number of levels of control and requires financial guarantees to support the delivery of successful rehabilitation and conservation outcomes. The Department has recommended conditions that reflect the requirements associated with this framework to ensure that rehabilitation is progressively monitored, adaptively managed and if necessary supplemented, to ensure that the ecological outcomes are achieved.

As described in **Section 2.3.3**, the Applicant is seeking to retire its offset credits in three stages, each linked with the progress of mining operations and progressive disturbance of native vegetation. The Applicant has already identified the majority of offset credits required to compensate for the biodiversity impacts associated with Stage 1 disturbance activities. These credits are derived from a combination of land-based offsets, ecological mine rehabilitation and other options under the new Biodiversity Offsets Scheme.

A key component of the Applicant's Stage 1 Biodiversity Offset Strategy includes the establishment of 878 ha of ecological mine rehabilitation to generate 4,230 upfront ecosystem credits under the FBA. The amount of rehabilitation credits received per hectare is about half the amount that would be generated by an equivalent established offset site and essentially represents the improvement in biodiversity outcomes between the highly disturbed site and the target ecological community.

The Applicant's Response Report provides information on the success of the rehabilitation programs being implemented at other Glencore sites, which it confirms have been used as a basis for the development of the rehabilitation strategy for this Project. As described in **Section 2.3.4** above, the Applicant's Response Report also includes case studies that have demonstrate the success of mine site rehabilitation at other mines sites, including the 'Assessment of Mine Rehabilitation Against Central Hunter Valley Eucalypt Forest and Woodland CEEC' (Umwelt, 2017).

The Applicant's proposed ecological mine rehabilitation would be subject to a rigorous regulatory framework including ongoing monitoring, adaptive management, various operational controls and financial guarantees to support the delivery of required rehabilitation and conservation outcomes. The Department has recommended conditions that reflect the requirements associated with this framework to ensure that rehabilitation is progressively monitored, adaptively managed and if necessary supplemented, to ensure that the ecological outcomes are achieved. Rehabilitation requirements would be further imposed under mining authorities issued under the *Mining Act 1992*, including a requirement to lodge a bond equivalent to the cost of achieving this rehabilitation outcome.

Should ongoing monitoring of the progressive rehabilitation indicate that it is not trending toward the expected completion criteria, the Applicant would be required to implement adaptive management measures (eg supplementary planting, weed control, etc) to improve these rehabilitation areas. Under the provisions of the mining authority, if the Applicant fails to achieve the appropriate completion criteria, the NSW Government has the ability to call in all or part of the rehabilitation bond to fund the necessary works. Finally, if it becomes clear that despite adaptive management, the quality of rehabilitation would be insufficient to achieve the required ecological outcomes for which biodiversity credits have been generated, the Applicant would instead have to source and retire an equivalent number and type of biodiversity credits; in consultation with OEH, in order to meet its residual offset requirement.

OTHER REHABILITATION CONDITIONS

To clarify the expected standards required to rehabilitate the site more generally, and to improve the likelihood that successful rehabilitation outcomes will be achieved, the Department has recommended a range of rehabilitation objectives for the Project. With these objectives in place, the Department is confident that the site could be rehabilitated to meet current best practice measures for the mining industry in NSW and that the Project could be managed to achieve appropriate final landform and sustainable rehabilitation outcomes.

To ensure that appropriate monitoring and adaptive management measures are in place, the Department has also recommended conditions that require the Applicant to prepare a Rehabilitation Strategy, Rehabilitation Management Plan and Mine Closure Plan. The Rehabilitation Strategy would provide the overarching standard for rehabilitation of the site and provide a framework to ensure that rehabilitation is an integrated part of the life of mine planning process. The Rehabilitation Management Plan would describe the rehabilitation measures to be undertaken on the site, including detailed performance and completion criteria for evaluating the performance of the rehabilitation and including triggers for remedial action, where these performance or completion criteria are not met. As discussed in **Section 2.4.2**, the Mine Closure Plan would be prepared nearer mine closure to investigate and prepare the site for post-mining beneficial land uses, to minimise the adverse socio-economic effects of mine closure and to minimise and manage the ongoing environmental effects on the site.

Resources Regulator has reviewed the recommended conditions and determined that sustainable rehabilitation outcomes could be achieved as a result of the Project and that any identified risks or opportunities could also be effectively regulated through the conditions of the mining lease under the *Mining Act 1992*.

2.5 Water Resources

The Commission made seven recommendations on water resources. These recommendations relate to final landform surface water catchments, available discharge licences, cumulative impacts, groundwater monitoring bores, monitoring of stygofauna and whether advice provided by the IESC has been satisfactorily addressed.

These recommendations have been considered in detail below.

2.5.1 Catchment Areas

Recommendation 37

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.

Summary of Response

The Applicant reports that the proposed final landform results in an overall increase of 53 ha of catchment reporting to final voids when compared to the currently approved final landform.

The Applicant's Response Report provides an analysis of the changes in proposed final catchment areas associated with the Project compared to the currently approved Wambo Coal Mine final landform areas (see Section 3.5).

The Applicant reports that the proposed final landform results in an overall increase of 53 ha of catchment reporting to final voids when compared to the currently approved final landform. This represents an overall 9% increase in the area, all of which is from the main Wollombi Brook catchment.

The Applicant considers that the impact on flows as a result of the change in the total Wollombi Brook catchment area would be negligible, primarily due to the large catchment area and highly regulated nature of the Hunter River.

Department acknowledges that the Project would reduce the Wollombi Brook catchment area relative to currently approved final landforms but accepts that the Project is unlikely to cause unacceptable impacts to the system over the long-term.

2.5.2 Hunter River Salinity Trading Scheme (HRSTS) Credits

Recommendation 38

The Applicant and the Department must confirm the extent of HRSTS credits held by the Project.

Summary of Response

The Applicant would need to secure approximately 63 HRSTS credits to meet the Project's water needs. The Department is satisfied that the required HRSTS credits are available in the market, and could be readily obtained, if needed.

The water balance presented in the EIS predicts that the Applicant would need to secure approximately 63 HRSTS credits to meet the Project's need for water discharges. The Applicant has confirmed that it does not directly hold any HRSTS credits, but that Glencore holds 389 HRSTS credits which could be easily accessed through trades, if necessary. The Department is satisfied that the required HRSTS credits are available in the market, and could readily be obtained, if needed.

2.5.3 Cumulative Impacts

Recommendation 39

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.

Summary of Response

Cumulative impacts on flow regimes, water quality, groundwater drawdowns and bores, baseflows and downstream water users are not predicted to be significant and can be managed through the proposed water management system and licence requirements under relevant NSW Government Water Sharing Plans.

As stated in the Department's PAR, the Project is located within a highly regulated water system that has been designed for the sustainable management of the State's water resources. The water licensing requirements of the *Water Management Act 2000* and the *Protection of the Environment Operations Act 1997* have consideration of cumulative impacts in their application. This includes licensing of allowable water take from both surface and groundwater, as well as water discharge volumes and quality.

As stated in the PAR, the Department is satisfied that both the Surface Water and Groundwater Impact Assessments included in the EIS and supplementary information contained in the RTS, include appropriate consideration of cumulative impacts of the Project and other mining operations on the downstream environment.

In terms of surface water, cumulative impacts were considered for the downstream environment in terms of water take, flows and water quality. The majority of water needs for the Project would be sourced from on-site sources, with supplementary supplies proposed to be sourced via licensed extraction from Wollombi Brook and the Hunter River. The Applicant currently holds sufficient licences to use water from Wollombi Brook and the Hunter River and no additional surface water licences are required for the Project.

Any mine discharges would be undertaken in accordance with the HRSTS. As discussed above, the Applicant has confirmed that it has access to sufficient HRSTS credits to discharge water from the site. As stated in the PAR, the Department is satisfied that the Project's proposed water management system has been designed to minimise potential risks to water quality to surrounding catchments and downstream water users.

In terms of groundwater, cumulative impacts were accounted for in the conceptual model of the groundwater regime, which included all approved and proposed mining operations in the region. The Department accepts that the Project would result in an incremental increase in the cumulative drawdown within both the Quaternary alluvium and deeper Permian aquifer systems. However, the Department is satisfied the groundwater licences required under the relevant Water Sharing Plans for both the existing operations and the Project are within current entitlements held by the Applicant.

Overall, as stated in the PAR, the Department is satisfied that the Project's water management system has been designed in accordance with relevant Government standards to limit potential impacts (including cumulative impacts) on downstream water quality and that water extraction and discharges can be undertaken in accordance with licence provisions.

To further analyse potential cumulative impacts associated with the Project and address the Commission's recommendation, the Applicant's Response Report provides a comprehensive consolidated analysis of the cumulative assessment considerations and potential water impacts against the different water resources aspects identified in the *Significant Impact Guidelines 1.3: Coal seam gas and large coal mining developments – impacts on water resources* (DoE 2013). The outcomes of this analysis are provided in Table 3.19 of the Applicant's Response Report. Cumulative impacts on flow regimes, water quality, groundwater drawdown and bores,

baseflows and downstream water users are not predicted to be significant and can be managed through the water management system and licensing requirements of the relevant Water Sharing Plans.

2.5.4 Groundwater Monitoring Bores

Recommendation 40

The Applicant should confirm why only 27 of 77 bores and 11 of 24 vibrating wire piezometers (VMPs) are currently monitored under Groundwater Monitoring Programs.

Recommendation 41

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.

Recommendation 42

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

Summary of Response

The Project is not predicted to impact any privately-owned bores located within alluvial aquifers. Groundwater levels within three mine-owned bores within the alluvial aquifers are predicted to decrease by a maximum of 1.6 m during mining and 0.74 m post mining.

If the Project is approved, the Applicant has committed to continue groundwater monitoring at the site and would install additional monitoring bores to provide a long-term groundwater monitoring network in all key groundwater bearing units. The Applicant has also committed to undertake periodic sampling of stygofauna.

The Applicant's Response Report confirms that the groundwater monitoring network historically included 77 bores and 24 VMPs. However, since its establishment in 2000, several of the bores are no longer monitored because they have either been abandoned due to failure or deterioration of the borehole, removed due to mine progression or are dry. All available 31 bores and 20 VMPs are being monitored.

As stated in the PAR and confirmed in the Applicant's Response Report, the Project is not predicted to impact any privately-owned bores located within alluvial aquifers. Groundwater levels within three mine-owned bores within the alluvial aquifers (GW017646, GW017648 and 10010974) are predicted to decrease by a maximum of 1.6 m during mining and 0.74 m post mining.

If the Project is approved, the Applicant has committed to continue the existing groundwater monitoring program and to install additional monitoring bores to provide a long-term groundwater monitoring network in all key groundwater bearing units. The existing and proposed bore and VMP locations are shown in **Figure 8**.

The Applicant has also committed to undertaking monthly to bi-monthly groundwater level and groundwater quality monitoring, including comprehensive water quality monitoring at existing bores on an annual basis and new bores on a quarterly basis.

The Department has recommended a condition requiring the preparation and implementation of a Groundwater Management Plan including a groundwater monitoring program, which would be required to be prepared prior to the commencement of development.



Legend

- Project Area
- Approved Wambo Surface Development Area
- Proposed Conceptual Extraction Area
- Quaternary Alluvium (1:25k AEG)
- Monitoring Bore (Existing)
- ▲ VWP (Existing)
- Monitoring Bore (Proposed)
- ▲ VWP (Proposed)

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Proposed Monitoring Bore Locations

Figure 8 | Existing and proposed monitoring bores locations

2.5.5 Stygofauna

In response to recommendations made by both the Department and the Commission, the Applicant has committed to a program of periodic sampling of stygofauna. It is noted that the Groundwater Impact Assessment completed as part of the EIS and the additional Stygofauna Assessment included in the RTS consider that the loss of stygofauna habitat as a result of groundwater drawdown associated with the Project would represent a low risk of threat to broader stygofauna populations and that these areas would be able to be recolonised in the long-term. To ensure this is the case, the Applicant has committed to monitoring stygofauna in the alluvial aquifers within or near the predicted drawdown areas prior to the commencement of mining and then every three years thereafter.

To reflect these commitments, the Department has recommended conditions requiring the Applicant to define performance criteria, including trigger levels for identifying and investigating any impacts on stygofauna as a result of the Project, and monitor against these criteria as part of the groundwater monitoring program.

2.5.6 IESC Requirements

Recommendation 43

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.

Summary of Response

The Department confirms that it remains satisfied with the information provided by the Applicant in relation to water resources. The proposed action is unlikely to have significant impacts on groundwater and surface water near the proposed mine and any impacts are able to be appropriately licensed, monitored and managed.

The IESC is a statutory committee of scientists that independently advises government regulators on the impacts that coal seam gas and large coal mining development may have on water resources. It is not the IESC's role to provide advice about the satisfaction or otherwise of a Project, instead it is to provide technical advice to inform decision-makers.

Advice from the IESC on the Project was provided on 14 October 2016. In response to IESC's advice, the Applicant provided detailed technical clarifications and undertook additional water-related work which was presented in its RTS. Additional information was also provided regarding the representation of water quality data, site-specific trigger values and modelling.

The Department considered IESC's advice in detail as part of its PAR (see Section 6.6.3). The Department indicated that "the response provided clarification on the IESC issues and a sound basis for a comprehensive assessment of the Project. Importantly, the Department notes that the additional information provided did not change the overall water resource assessment outcomes as presented in the EIS" (p 87 of the PAR).

The PAR also provided detailed consideration of IESC's issues and the Applicant's response in relation to:

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

The Department confirms that it remains satisfied with the information provided by the Applicant in relation to water resources and "that there would not be significant impacts on water resources in relation to the Project, above and beyond those already approved. The proposed action is unlikely to have significant impacts on groundwater and surface water near the proposed mine and any impacts are able to be appropriately licensed, monitored and managed" (p 88 of the PAR).

2.6 Visual Impacts

The Commission made one recommendation regarding the need for additional visual mitigation measures for private residences, vehicles travelling along the Golden Highway and other sensitive viewpoints. This recommendation has been considered in detail below.

Recommendation 44

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.

Summary of Response

The Applicant has considered further visual mitigation measures to address potential visual impacts of the Project. In addition to its previous commitments discussed in the PAR (Section 6.11), the Applicant has committed to offering additional landscaping/visual mitigation works to eight private residences in Moses Crossing and South Wambo, and to any other landowners where adverse impacts are identified. The Applicant has also committed to undertaking tree screening along the Golden Highway to minimise views of the operations.

The Department is satisfied that the Applicant has sufficiently considered all reasonable and feasible visual mitigation measures to minimise the visual impacts of the Project. The Department is satisfied with the additional measures proposed for nearby residences and the Golden Highway and has recommended conditions to reflect these commitments.

As discussed in the PAR (Section 6.11), the Applicant's previous visual mitigation commitments included:

- reducing the duration of visible soil exposure through progressive rehabilitation;
- planting trees along existing and realigned sections of the Golden Highway to screen views of the Project;
- consulting with residents in Moses Crossing and South Wambo regarding installing additional tree screening/ landscaping to minimise visibility of the Project;
- ensuring night lighting is installed and maintained to reduce night time light pollution; and
- preparing an agreement with the Hunter Valley Gliding Club (HVGC) to identify ways to mitigate visual impacts.

In light of the Commission's recommendation to investigate further mitigation options, the Applicant has focused on the closest private residences in Moses Crossing and South Wambo that would have direct views of the Project. The Applicant has already offered landscaping works to mitigate visual impacts to receivers R25 and R44 and has committed to offering landscaping works to receivers R3, R16, R17, R39, R43, R50 and any other landowners where adverse impacts are identified. If requested by the landowner, a landscape design specialist would be commissioned to advise on appropriate visual mitigation measures, which may include screening, landscaping or building modifications.

To minimise views of the Project from the Golden Highway, the Applicant has committed to installing tree screens that are:

- planted and maintained in consultation with RMS;
- planted in conjunction with the road works and prior to the use of the realigned Golden Highway; and
- strategically located along existing and/or realigned sections of the Golden Highway either within the site or on private land (subject to landowner agreement).

The Department is satisfied that the Applicant has sufficiently considered all reasonable and feasible visual mitigation measures to minimise the visual impacts of the Project. The Department is satisfied with the additional

measures proposed for nearby residences and the Golden Highway and has recommended conditions to reflect these commitments.

2.7 Transition to the Joint Venture

The Commission made three recommendations related to the transition to the joint venture, including the need for additional clarity around the triggers, staging and mechanisms for the transfer of responsibility to the joint venture, management of environmental compliance, licensing and interactions between development consents, community engagement, complex-wide ROM coal production and output and how the Project should be conditioned.

These recommendations have been considered in detail below.

Recommendation 45

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.

Recommendation 46

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.

Recommendation 47

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.

Summary of Response

The Applicant's Response Report (Section 3.8) and additional information response dated 11 October 2018 included additional information on the proposed transition to the joint venture, including clarifying the proposed operational and environmental management responsibilities during this transitional period.

The Department agrees that a clear framework is required to ensure a seamless transition to the full joint venture Project. The Applicant is proposing an interim stage (Phase 1) to facilitate this transition. The Department is satisfied that a clear division of environmental management responsibilities can be achieved through phased development and carefully drafted conditions.

The Department has endeavoured to draft conditions to address these recommendations.

The Applicant's Response Report (see Section 3.8) and additional information response dated 11 October 2018 included further information on the proposed transition to the joint venture. The Applicant has clarified that the

integration of open cut operations would take approximately 12 to 15 months due to the expected lead times for establishing the new United open cut and then transferring operational, environmental and safety management responsibilities from Peabody to Glencore. This time is also required to gain all necessary pre-commencement approvals and to undertake necessary construction and preparatory works. During this transitional period, Peabody would retain responsibility for the Wambo open cut operations and continue to operate business as usual. The Applicant has termed this stage 'Phase 1'. Activities at United open cut would be further divided into Phase 1A and Phase 1B to differentiate between low impact construction activities and higher impact mining operations.

'Phase 2' would then be the stage when the joint venture commences (ie when Glencore takes over responsibility for Wambo open cut operations). The two phases are summarised in **Table 9** below.

Table 9 | Development phases

Development Consents	Phase 1		Phase 2	Phase 3
	Phase 1A	Phase 1B		
United Wambo Open Cut Coal Mine SSD 7142	Construction and preparatory works at United open cut	Commencement of open cut mining operations United open cut	Integration of United and Wambo open cut operations	Mine closure (decommissioning and rehabilitation)
Wambo Coal Mine DA 305-7-2003	Continuation of approved Wambo open cut mine			Additional processing of United ROM coal
	Continuation of approved Wambo underground mine			
	Continuation of approved use of Wambo mine infrastructure (including processing of Wambo ROM coal)			
Wambo Train Loading Facility DA 177-8-2004	Continuation of approved rail loading (including despatch of Wambo product coal)		Additional despatch of United product coal	Mine closure (decommissioning and rehabilitation)

2.7.1 Phased Development

The recommended conditions of consent have been based on the three phases of development (Phase 1A/1B, 2 and 3). Key definitions, figures and pre-commencement requirements have been included in the consents to ensure there is a clear division and/or handover of environmental management responsibilities between DA 305-7-2003 and SSD 7142.

UNITED OPEN CUT PHASE 1A

During Phase 1A, activities at United open cut would be limited to construction and preparatory works, comprising:

- installation of erosion and sediment controls and water management infrastructure;
- establishment of a temporary mining and construction infrastructure area;
- continued operation and upgrade of the existing United infrastructure;
- realignment of the Golden Highway, transmission lines and telecommunication lines;
- extraction from a borrow pit;
- construction of internal haul roads and access roads using material won on the site; and
- installation of lighting and services.

These works would be undertaken by Glencore within the blue 'United operational area' shown in **Figure 9**.

To appropriately manage these works, Glencore proposes to prepare a Construction Environmental Management Plan and Heritage, Biodiversity and Water Management Plans. The Department agrees these plans should be

prepared prior to commencement of Phase 1A and has recommended conditions accordingly. The Department further notes that a Blast Management Plan would also be required prior to undertaking any blasts on the site (including within the borrow pit).

The Construction Environmental Management Plan would describe the specific environmental management measures for the Phase 1A construction works and the measures to be implemented to minimise construction-related traffic, noise, dust and visual amenity impacts.

As recommended by RMS, the Department has also recommended a condition requiring the Applicant prepare a Construction Traffic Management Plan for the Golden Highway alignment to ensure that traffic safety issues and other road user conflicts are minimised during the road construction works.

The Department has summarised the pre-commencement management plans requirements for each phase in **Table 10**.

UNITED OPEN CUT PHASE 1B

During Phase 1B, activities at United open cut would include continued construction and preparatory works and the commencement of mining operations. Open cut mining operations would be undertaken by Glencore within the blue 'United operation area' shown in **Figure 10**. Overburden material and ROM coal would be emplaced or stockpiled within this area.

Glencore proposes to prepare the remaining Air Quality, Noise and Rehabilitation Management Plans for the Project. The Department agrees these plans should be prepared prior to commencement of Phase 1B and has recommended conditions accordingly.

The Department has also recommended that Glencore prepares a Social Impact Management Plan (SIMP) prior to the commencement of Phase 1B. The purpose of the SIMP is to build on the Social Impact and Opportunities Assessment undertaken as part of the EIS and to manage and mitigate social impacts over the life of the Project. As part of the SIMP, the Applicant would be required to further identify negative social impacts resulting from the Project, specify adaptive management and mitigation measures to avoid, minimise, and/or mitigate negative social impacts, identify opportunities to secure and enhance positive social impacts, include a program to monitor, review, and report on the effectiveness of these measures and include a Stakeholder Engagement Plan to guide the evaluation and implementation of social impact management and mitigation measures.

WAMBO COAL MINE PHASE 1

Wambo Coal Mine would generally continue business as usual during Phase 1 (ie continued open cut and underground mining operations). Wambo Coal Mine would continue to process ROM coal at its CHPP and despatch product coal via its existing rail loading facility and rail loop. Minor upgrades to the Wambo MIA including the construction of a new workshop, fuel farm, administration offices and carpark would be undertaken during this phase. Surface development would continue to occur within the green 'Wambo operational area' shown in **Figure 10**.

To manage these operations, Peabody has proposed continued implementation of its existing approved environmental management plans, most of which have been recently updated following the determination of Modification 17 in December 2017. The Department is satisfied with this approach and has recommended a condition allowing Wambo to continue application of previously approved management plans for this phase.

UNITED OPEN CUT PHASE 2

Phase 2 represents commencement of the joint venture when the first coal is delivered to the Wambo CHPP. During this phase, Glencore would take over responsibility of the Wambo open cut operations. The open cut

mining operations would be undertaken by Glencore within the larger blue 'United operational area' shown in **Figure 11**.

Prior to commencement of this phase, Glencore would be required to prepare the Rehabilitation Strategy and update all management plans for the Project to reflect the larger-scale integrated operations.

Prior to commencement of this phase, Glencore would also be required to enter into an agreement with Hunter Valley Gliding Club Co-operative Limited to address the potential impacts of the development on the Hunter Valley Gliding Club facilities and associated recreational activities.

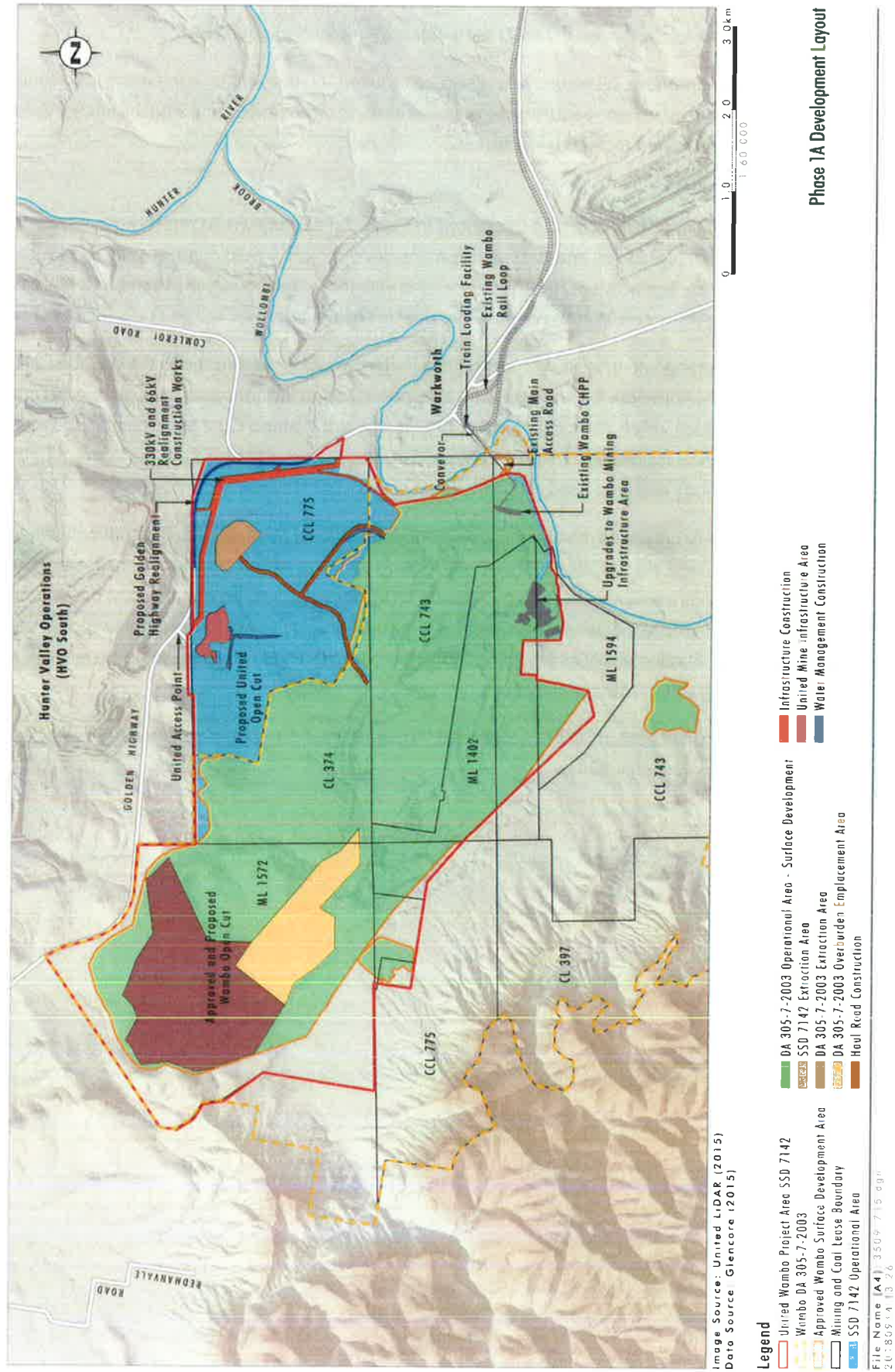
WAMBO COAL MINE PHASE 2

Wambo Coal Mine would relinquish its open cut operations in Phase 2. Peabody would retain responsibility for underground operations, coal processing and despatch. Surface development would consequently be reduced to just the areas required for surface activities/facilities associated with the underground, the Wambo CHPP, MIA and train loading facility (see the green 'Wambo operational area' in **Figure 11**).

As part of the joint venture arrangement, all ROM coal from the Project would be transferred to the Wambo CHPP for processing and despatch. Appendix 4 of the Applicant's Response Report includes a summary of forecast coal production (ROM and product) which demonstrates that the Project and Wambo Coal Mine combined would comply with the existing annual rail haulage limits of 15 Mtpa. Coarse reject and tailings from the Wambo CHPP would be managed by Peabody and emplaced within the open cut voids as is currently the practice.

Peabody would be required to update all management plans for Wambo Coal Mine, prior to the commencement of Phase 2 to reflect the smaller-scale operations. This would include updating its Rehabilitation Management Plan to include a life of mine tailings management strategy because all ROM coal would be processed at the Wambo CHPP and preparing a new Traffic Management Plan because a majority of vehicles would use its mine access road off of the Golden Highway. Blasting activities would no longer be permitted and Peabody would be relieved of preparing and implementing a Blast Management Plan.

Underground operations would cease in 2039 as approved; however, Peabody would continue to process and despatch coal for the joint venture until 2041.



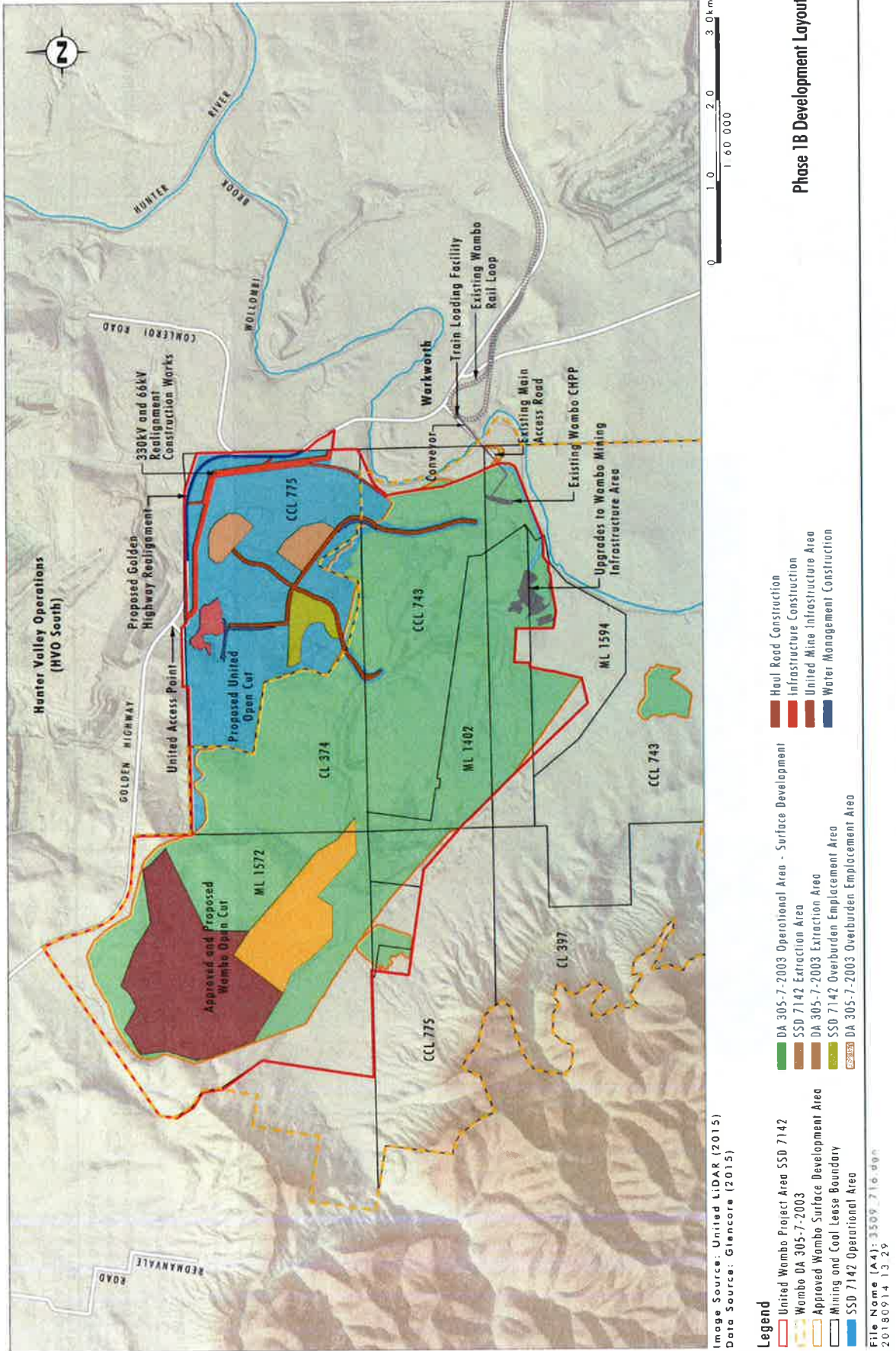


Figure 10 | Phase 1B development layout

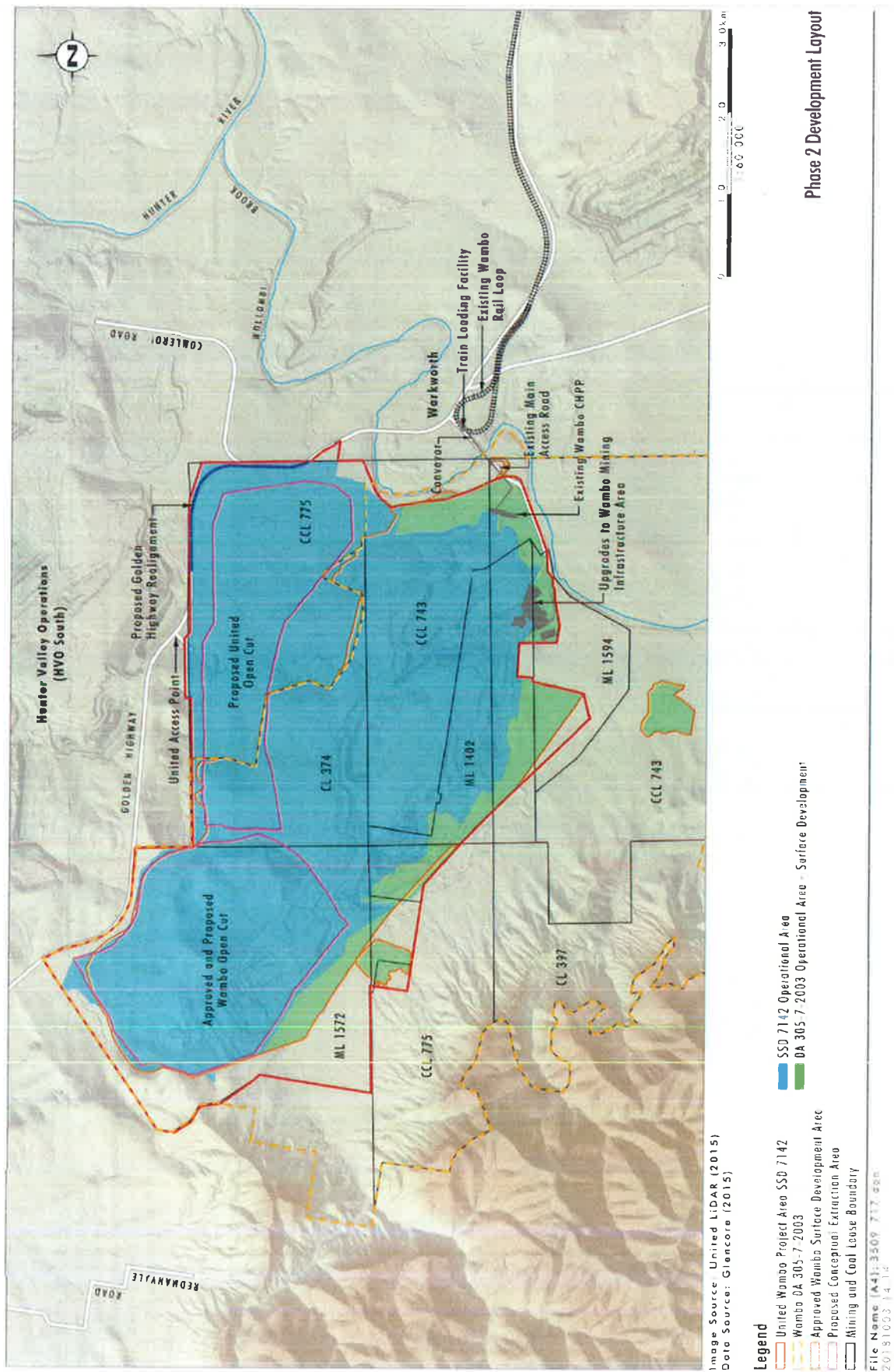


Figure 11 | Phase 2 development layout

PHASE 3

The Department has proposed a final stage, Phase 3, to cover mine closure requirements across the three consents. Mine closure includes decommissioning and final rehabilitation of the site following the cessation of mining operations. Glencore and Peabody would be required to rehabilitate their respective operational areas. Importantly, this includes Glencore taking over responsibility for 1,300 ha of Wambo Coal Mine's 1,570 ha requirement to regenerate open woodland on the site. Rehabilitation objectives and requirements in both consents have been aligned to ensure that the entire site is rehabilitated in an integrated manner.

Table 10 | Environmental management plan approval requirements

Development Consents	Phase 1		Phase 2
	Phase 1A	Phase 1B	
United Wambo Open Cut Coal Mine SSD 7142	Pre-commencement management plans: <ul style="list-style-type: none"> Construction Environmental Historic Heritage Aboriginal Cultural Heritage Biodiversity Water Social Prior to undertaking any blasting: <ul style="list-style-type: none"> Blast Prior to undertaking Golden Hwy realignment: <ul style="list-style-type: none"> Construction Traffic Management Plan 	Pre-commencement management plans: <ul style="list-style-type: none"> Noise Air Quality Rehabilitation Environmental Management Strategy 	Pre-commencement management plans: <ul style="list-style-type: none"> Rehabilitation Management Strategy Comprehensive update of all management plans and strategies Five years prior to closure: <ul style="list-style-type: none"> Mine Closure Plan
Wambo Coal Mine DA 305-7-2003	Pre-commencement management plan: <ul style="list-style-type: none"> Blast 	NA	Pre-commencement management plans: <ul style="list-style-type: none"> Comprehensive update of all management plans and strategies New Traffic Management Plan
Wambo Train Loading Facility DA 177-8-2004	Within three months of determination of Modification 3: <ul style="list-style-type: none"> Environmental Monitoring Program Environmental Management Strategy 		

2.7.2 Environment Protection Licence (EPL)

Like the consents, Glencore and Peabody would also retain separate EPLs. The Department notes that the EPLs would need to be varied to reflect each of the phases and the proposed 'operational areas' should generally align with the EPL premise boundaries.

2.7.3 Community Consultative Committee (CCC)

The Department has recommended that Glencore continue operation of the United CCC established under DA 410-11-2002-I and that Wambo continue operation of the Wambo Mining Complex CCC.

The Department has also recommended a condition that would allow these CCC's to be combined if the companies wish to pursue this further.



3. Other Matters

3.1 Planning Agreement

VPAs between planning authorities and developers are commonly used to exact public benefits from the planning process. Under a VPA, a developer agrees to provide or fund a public purpose, such as public amenities and public services, affordable housing, or transport or other infrastructure. Through practice notes and planning circulars, the Department encourages there to be a nexus of some kind between the nominated contributions and the development and that these contributions are put towards local community needs.

VPAs are intended to be negotiated in good faith to ensure that fair and reasonable contributions are put towards public benefits. This mechanism allows for flexibility and innovation but can also create uncertainty in the process, leading to misaligned expectations from both parties and the community.

3.1.1 Mining VPAs

NSWMC and the Association of Mining and Energy Related Councils (MERC) have been working together on a framework to govern and improve the integrity of VPA negotiation process between mining companies and councils. The Department understands that whilst significant progress has been made, negotiations between these two parties have stalled due to disagreement over the methodology used for quantifying non-road related infrastructure contributions. An agreed methodology is being sought to provide greater transparency and consistency; however, the Department acknowledges the difficulties in identifying a single basis for mines as they can vary significantly in scale and impact. For example, utilising a 'cents per tonne of product produced', 'worker domicile' or 'percentage of the CIV' basis may provide a simple solution, but the nexus between these outputs and the development may be less evident.

The Department's Policy and Strategy Division is assisting NSWMC and MERC with developing this framework, but they are unlikely to be resolved prior to this application being determined.

3.1.2 Glencore's Offer

Glencore has committed to entering into a VPA with Council to contribute to programs designed to improve or address local community issues and perceived impacts of the Project.

Glencore made an offer of \$1.2 million to Council on 8 February 2018 based on a proposed allocation of 50% towards the immediately affected communities of Jerrys Plains and Warkworth and the remaining 50% to be distributed across the wider local government area (LGA, see **Table 11**). The aspects listed in this table are linked to the opportunities for community development identified in the Social Impact and Opportunity Assessment (SIOA) prepared as part of the EIS. The relevant opportunities centred around improving and maintaining public spaces, community infrastructure and services. The remaining contributions would be offered to the Singleton Community and Economic Development Fund to be used towards facilitating future security, prosperity and wellbeing of the LGA.

The Department understands that this offer was rejected by Council on the basis that it would only accept a quantum based on 1% of the CIV.

Table 11 | Glencore's VPA offer

Aspect	Description	Contribution
Jerrys Plains Village Centre	Implement gateway treatment for both approaches along the Highway to the village incorporating signage, rural fences and street trees. An opportunity for the Jerrys Plains Recreational Grounds and the Jerrys Plains Pony Club to form part of the gateway to the village of Jerrys Plains.	Concept \$20,000 Implementation \$100,000 Contribution: \$120,000 Fully Funded
Jerrys Plains Upgrade Recreation Grounds	<ul style="list-style-type: none"> Fencing, water feature and seating Street planning incl. additional trees Playground shelter, exercise equipment RV Dump point 	Concept \$20,000 Implementation \$300,000 Contribution: \$320,000 Fully Funded
Jerrys Plains Main Street Upgrade	<ul style="list-style-type: none"> Gateway treatment Landscaping Cycleway and pedestrian refuge RV/Truck parking 	Concept \$80,000 Implementation \$3-4 Million Contribution: \$125,000 Partially Funded
Warkworth	Development of a booklet that documents the history and heritage of Warkworth. Contributions for maintenance of: <ul style="list-style-type: none"> Jim Johnstone oval Warkworth Community Hall St Philips Church 	Contribution: \$35,000 Fully Funded
Total		\$600,000 (50% Local) \$600,000 (50% LGA) \$1,200,000

3.1.3 Council's VPA Position

The Department notes that Council is currently reviewing its Development Contributions Plan and in November 2017 resolved to calculate mine-related development contributions based on either a cents per tonne or 1% CIV basis. Based on the CIV for this Project, this would equate to \$3.81 million.

3.1.4 Revised Capital Investment Value

In the Applicant's Response Report, Glencore made it clear that it did not agree that CIV should be used as the sole basis for determining development contributions in a VPA, particularly as capital relating to mining equipment has no direct impact on Council's facilities or the community generally. In its Response Report, Glencore provided a significantly reduced CIV of \$207 million (leading to an equivalent levy of \$2.07 million) based on removing a portion of capital associated with mining equipment already in use at Wambo Coal Mine.

The Department requested additional justification be provided on this revised CIV calculation and questioned if this recalculation also affected the previously assessed economic benefits of the Project. The Applicant clarified that this CIV revision was only for the purposes of calculating the VPA, as it is of the view that capital related to existing equipment should not be considered in the context of the VPA, and that there is no effect on the economics of the Project as the total cashflows would not change.

The Applicant does not support the use of the CIV in assessing the VPA contribution; however, should this methodology be applied moving forward, the Applicant recalculated the capital cost of the Project based on removing this existing mining equipment. This led to a significant \$174 million reduction in CIV.

The Department accepts that this revised CIV generally aligns with the requirements under the EP&A Regulation and the Department's 2010 Planning Circular PS10-008, which state that "costs relating to any part of the development or project that is the subject of a separate development consent or project approval" should be excluded from the CIV calculation. This means that it could be considered acceptable, for the purposes of the VPA, to remove costs of equipment that are already part of Wambo Coal Mine.

3.1.5 Independent Review of VPA Offer

It is disappointing that the Applicant and Council have not pursued further mediation or arbitration processes to resolve this matter over the past nine months but the Department understands that this impasse is linked more broadly to the stalled negotiations between NSWMC and MERC. Nevertheless, the Department considers that these stalled negotiations should not delay the determination of this application.

Recognising the sensitivities around this issue, the Department considered it necessary, in this instance, to engage an independent development contributions expert to review and provide advice on appropriate development contributions for the Project. The Department engaged GLN Planning on 25 October 2018 to review the acceptability and reasonableness of Glencore's offer, including consideration of both the quantum and distribution of funds, having regard to Council's response to the offer and its November 2017 resolution, community expectations, the predicted impacts of the Project and current VPA policies, guidelines and practice notes.

GLN Planning's review is ongoing; however, the Department is confident that these findings will facilitate resolving the impasse prior to determination. Both the Applicant and Council are supportive of seeking third-party independent advice on the matter and have agreed, in principle, to come to an agreement based on GLN Planning's findings. Once agreed, Appendix 9 of the recommended conditions of consent for SSD 7142 would need to be updated.



4. Recommended Conditions

In making its recommendations to the Commission, the Department has drafted recommended conditions of consent (see **Appendix F**) that reflect the Commission's review recommendations, the Applicant's Response to the Commission's Review, the Department's preliminary and final assessment reports, public submissions, advice from Government agencies and final comments received from the Applicant.

Appendix F includes both recommended conditions of consent for the Project and notices of modification for the Wambo Coal Mine Modification 16 and the Wambo Train Loading Facility Modification 3. The Department considers that these recommended conditions reflect best practice and provide a sound basis for preventing, minimising and/or offsetting the impacts of the Project.

The recommended conditions have been based on the Department's indicative standard administrative and reporting conditions for State Significant Development that were released in August of this year.

Both Glencore and Peabody have reviewed and accepted the recommended conditions of consent.

4.1 Project Conditions

The recommended conditions of consent for SSD 7142 include five key parts:

- Part A – Administrative Conditions: including conditions that set out the key obligations, terms and limits of the consent;
- Part B – Specific Environmental Conditions: including strict performance measures and standards, operating and/or management conditions for noise, blasting, air quality, water, biodiversity, historic heritage, Aboriginal cultural heritage, visual amenity, waste, dangerous goods, bushfire management, rehabilitation, social impacts and transportation;
- Part C – Construction Specific Conditions: including specific operating conditions for the initial Phase 1A construction stage including the Golden Highway realignment road works;
- Part D – Additional Procedures: including additional procedures for notifying and engaging with landowners/tenants potentially impacted by the Project, such as procedures for acquisition and mitigation upon request; and
- Part E – Environmental Management, Reporting and Auditing: including generic guidance on environmental management, incident and non-compliance notifications, annual reporting, independent audits, monitoring and public access to information.

The Department is satisfied that these recommended conditions are reasonable and would provide an appropriate level of protection to ensure that the Project can be undertaken in an environmentally sustainable manner.

4.2 Wambo Conditions

The Department has proposed a full replacement of Schedules 2 to 6 within both Wambo consents. This has been proposed for the following reasons:

- aligning and integrating conditions with SSD 7142, including harmonising the operational life and related stages across all three consents;
- updating all administrative conditions to reflect the Department's indicative standard conditions;
- updating all operating and environmental management conditions to reflect the Department's current drafting standards and to ensure adherence to best practice;
- updating all agency, policy and legislation references, where relevant;
- removing redundant conditions; and
- simplifying DA 305-7-2003, which has been modified on 16 previous occasions.

Importantly, the Department has carried over all outstanding obligations, ongoing commitments and project-specific conditions to ensure that Peabody retains responsibility for all previously imposed requirements which remain necessary. The Department has also maintained all conditions relevant to underground mining.

Key changes to DA 305-7-2003 include:

- outlining the development phases and notification requirements for each phase;
- allowing Peabody to operate under existing approved management plans during Phase 1, except for requiring an updated Blast Management Plan;
- including flexibility to allow management strategies, plans, or programs to be combined with similar strategies, plans or programs required under SSD 7142 and DA 177-8-2004;
- tidying up existing noise criteria and making it only applicable to Phase 1;
- introducing new lower noise criteria for Phase 2 when the mine shifts to a predominantly underground operation;
- updating the air quality criteria to align with the Approved Methods 2016;

- updating the acquisition and mitigation rights tables by removing receivers that are now mine-owned and adding the three receivers that are predicted to experience moderate to significant noise impacts;
- including new water performance measures;
- requiring Peabody to prepare a conservation bond for the remnant woodland enhancement areas;
- updating the mine's rehabilitation objectives to contemporary industry standards;
- reducing the open woodland revegetation requirements to align with the remaining development area under Peabody's responsibility (ie 270 ha);
- ensuring that the Rehabilitation Management Plan addresses tailings management for the entire joint venture, as Peabody would be responsible for processing all coal at the Wambo CHPP and emplacing all reject material;
- requiring Peabody to prepare a new Traffic Management Plan because the majority of both heavy and light vehicle traffic would use its mine access road off the Golden Highway;
- including new incident and non-compliance definitions and notification requirements; and
- updating all project-related figures.

The Wambo Train Loading Facility consent (DA 177-8-2004) has also been significantly simplified because many of the previous conditions related solely to construction of the loading and refuelling facility. The Department has retained relevant performance measures and operating conditions and has recommended that Peabody prepares an Environmental Monitoring Program and Environmental Management Strategy.

The Department is satisfied that the proposed changes are commensurate with the risk of impact and provide a clear framework for environmental management of the Wambo Coal Mine and Wambo Train Loading Facility in the long-term.



5. Conclusion

The Department has carefully considered all recommendations in the Commission's Review Report, the Applicant's Response Report and additional information responses, advice from key Government agencies and advice from independent experts engaged by the Department. Additionally, the Department has consulted with the Applicant and key Government agencies regarding the recommended conditions of consent in **Appendix F**.

The Department is satisfied that the Applicant has appropriately addressed all of the Commission's recommendations in its Response Report. The Department considers that its assessment process has been detailed, extensive and informed by community views, relevant agency input and technical experts. The Department is therefore confident that its preliminary assessment and final assessment reports together provide a robust assessment of the merits of the Project.

The Department maintains that the Project is a logical and strategic extension of open cut mining operations at Wambo Coal Mine and United Colliery. The joint venture would facilitate efficient and optimised recovery of a significant coal resource with fewer environmental impacts than would be expected from an equivalent greenfield project. The Department is satisfied that the proposed management, mitigation and offset measures would appropriately minimise and compensate for any residual adverse social, environmental and economic impacts of the Project. The Project would provide substantial social and economic benefits and the Department is satisfied that it would deliver a net benefit to the State.

The Department is satisfied that its recommended conditions provide a comprehensive, contemporary and precautionary approach to the regulation and management of the Project. These conditions require appropriate and strict compliance with relevant performance measures and standards to ensure that any residual impacts are effectively mitigated. The Department considers that these conditions represent current best practice for regulating open cut coal mines in NSW. These conditions also provide a high level of protection for the local environment and the amenity of the local community and promote the orderly development of the State's significant coal resources.

The Department is satisfied that the benefits of the Project outweigh its residual costs and considers that the Project is in the public interest and is approvable, subject to strict conditions of consent.



6. Recommendation

Following its final assessment of the Project, the Department of Planning and Environment considers that the development application (SSD 7142) and associated modifications (DA 305-7-2003 MOD 16 and DA 177-8-2004 MOD 3) are approvable, subject to the conditions outlined in **Appendix F**. This final assessment report is hereby presented to the Independent Planning Commission for determination of the development application and the associated modifications.

Recommended by:


7/11/18

Megan Dawson

Team Leader

Resource Assessments

Recommended by:


7/11/18

Jessie Evans

A/Director

Resource Assessments