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BENGALLA MINE TEMPORARY EMPLACEMENT AREA

MODIFICATION REPORT

for Bengalla Mining Company Pty Limited

20 February 2025

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EXECUTIVE SUMMARY

Bengalla Mining Company Pty Limited (BMC) operates the Bengalla Mine (Bengalla) in the Upper Hunter Valley of NSW. Bengalla is approved by Development Consent SSD-5170 granted under the then Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). SSD-5170 (as modified) authorises the continuation of open cut coal mining and associated activities at Bengalla until 28 February 2039.

THE MODIFICATION

BMC is seeking a Modification to facilitate the construction of a Temporary Overburden Emplacement Area (TOEA). The TOEA will temporarily stockpile approximately 11 Million loose cubic metres (Mlcm) of waste overburden material within the existing Overburden Emplacement Area (OEA) footprint. While the interim landform will be approximately 25m higher than the approved final landform within the TOEA footprint, it remains 20m lower than the maximum approved final landform height of RL300m.

ENVIRONMENTAL IMPACTS

The key environmental aspects of the Modification are the potential dust and noise emissions and visual impacts associated with the development of the TOEA. Suitably qualified experts have been engaged to assess these potential impacts.

The Modification has the potential to generate dust through vehicle movements, handling of overburden materials and windblown dust from temporarily exposed elevated surfaces. The air quality expert (Todoroski Air Sciences) estimated that the Modification would increase dust emissions by approximately 0.36-0.43% relative to the approved operations. This minor increase is unlikely to be discernible beyond the existing dust levels at private receptors in the vicinity of Bengalla and can be managed through the implementation of controls described in the Bengalla Air Quality Management Plan (AQMP).

The Modification may generate noise through the use of mobile equipment. The acoustics expert (Bridges Acoustics) concluded that in the context of existing Bengalla operations, it is unlikely that the Modification would result any appreciable changes in noise levels at any receptor in addition to those approved under SSD-5170. The ongoing implementation of the active and reactive noise mitigation strategies outlined in the Bengalla Noise Management Plan (NMP) will further ensure compliance with the relevant noise criteria.

Views of the proposed TOEA will be limited by the rehabilitated extent of the existing OEA, topography, vegetation and existing screening measures. The Modification will not increase the vertical elevation of the approved final landform and the TOEA is lower in the viewshed than the existing Main OEA. As such it is unlikely to become visible to viewing locations that do not have existing views of Bengalla.

The visual effects of the Modification were assessed to be low at all potential viewing locations as the TOEA is situated within the active face of the Main OEA. In the broader visual context of approved Bengalla operations, the difference will be a minor percentage of overall viewshed. The TOEA is considered to be visually contiguous with the currently approved OEA. As such, the visual impacts associated with the Modification were assessed to be low.

JUSTIFICATION

The Modification involves a relatively minor and temporary adjustment to the approved final landform at Bengalla.

Construction of the TOEA will enable BMC to temporarily stockpile waste overburden material in a central location within the existing OEA footprint. This Modification will enhance the flexibility of the Bengalla mine plan, resulting in increased operational efficiency and reduced environmental impacts associated with haulage activities.

The placement of overburden at the proposed location provides the opportunity for either the development of a proposed improved final landform or for the material to be later rehandled into the final void to comply with the currently approved final landform.

The potential environmental impacts of the Modification do not vary or alter the character or scale of the approved development. Given that the Modification will not materially exacerbate impacts on the surrounding environment and sensitive receptors, the environmental costs of the Modification are outweighed by its benefits.

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1. INTRODUCTION

This section introduces the Modification, the proponent and the development sought to be modified.

1.1 BACKGROUND

Bengalla Mining Company Pty Limited (BMC) operates the Bengalla Mine (Bengalla) in the Upper Hunter Valley of NSW. Bengalla is located approximately 130 kilometres (km) north-west of Newcastle and 4 km west of Muswellbrook (see **Figure 1**).

Bengalla is managed in accordance with Development Consent SSD-5170 granted under the then Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). SSD-5170 (as modified) enables the continuation of open cut coal mining and associated activities at Bengalla until 28 February 2039.

SSD-5170 has been modified on five occasions as follows:

- MOD 1 - alterations to various water management infrastructure and the relocation of an explosives storage facility;
- MOD 2 -amended the approved Main Overburden Emplacement Area (OEA) to improve visual amenity and establish a new access road;
- MOD 3 - authorised minor adjustments to the positioning and operation of an explosives and reload facility, realignment of the Hunter River pipeline and emplacement and use of temporary topsoil stockpiles;
- MOD 4 – authorised updates to the water management system, temporary storage of earthen materials for dam construction and other suitable clay material for the future construction of the Dry Creek realignment, increased capacity of (and location for) Run of Mine (ROM) coal stockpiles and additional storage locations for temporary emplacement of reject material; and
- MOD 5 - authorising the use of a mobile crusher to process hard rock for use on site, the expansion of the ROM coal stockpiling area, changes to the Southern visual bund, realignment of diversion drains, in-pit disposal of tyres and minor administrative changes to conditions of SSD-5170.

Modification 6 authorising the installation and operation of two water pipelines from the MSC Wastewater Treatment Plant locality to Bengalla to transfer recycled and potable water for use in operations is currently on hold.

The conditions of SSD-5170 require the development to be carried out generally in accordance with:

- '*Continuation of Bengalla Mine Environmental Impact Statement'* (Hansen Bailey, 2013) as modified by the '*Continuation of Bengalla Mine Response to Submissions*' (Hansen Bailey, 2014) (collectively referred to as the Bengalla EIS);
- '*Bengalla Mine Development Consent Modification Statement of Environmental Effects*' (Hansen Bailey, 2015a) and Response to Submissions (Hansen Bailey, 2015b) (MOD1 SEE);
- '*Bengalla Mine Development Consent Modification Statement of Environmental Effects*' (Hansen Bailey, 2016a) and Response to Submissions (Hansen Bailey, 2016b) (MOD2 SEE);
- '*Bengalla Mine Development Consent Modification 3 Statement of Environmental Effects*' (Hansen Bailey, 2016c) and Response to Submissions (Hansen Bailey, 2016d) (MOD3 SEE);
- '*Bengalla Mine Development Consent SSD-5170 Modification 4 Statement of Environmental Effects*' (Hansen Bailey, 2017), Response to Submissions (Hansen Bailey, 2018) and additional information dated July 2018 and November 2018 (MOD4 SEE); and

- '*Bengalla Mine Development Consent SSD-5170 Modification 5 Modification Report*' (James Bailey Associates, 2021), *Submissions Response and* '*Response to Request for Additional Information*' (James Bailey Associates, 2022) (MOD5).

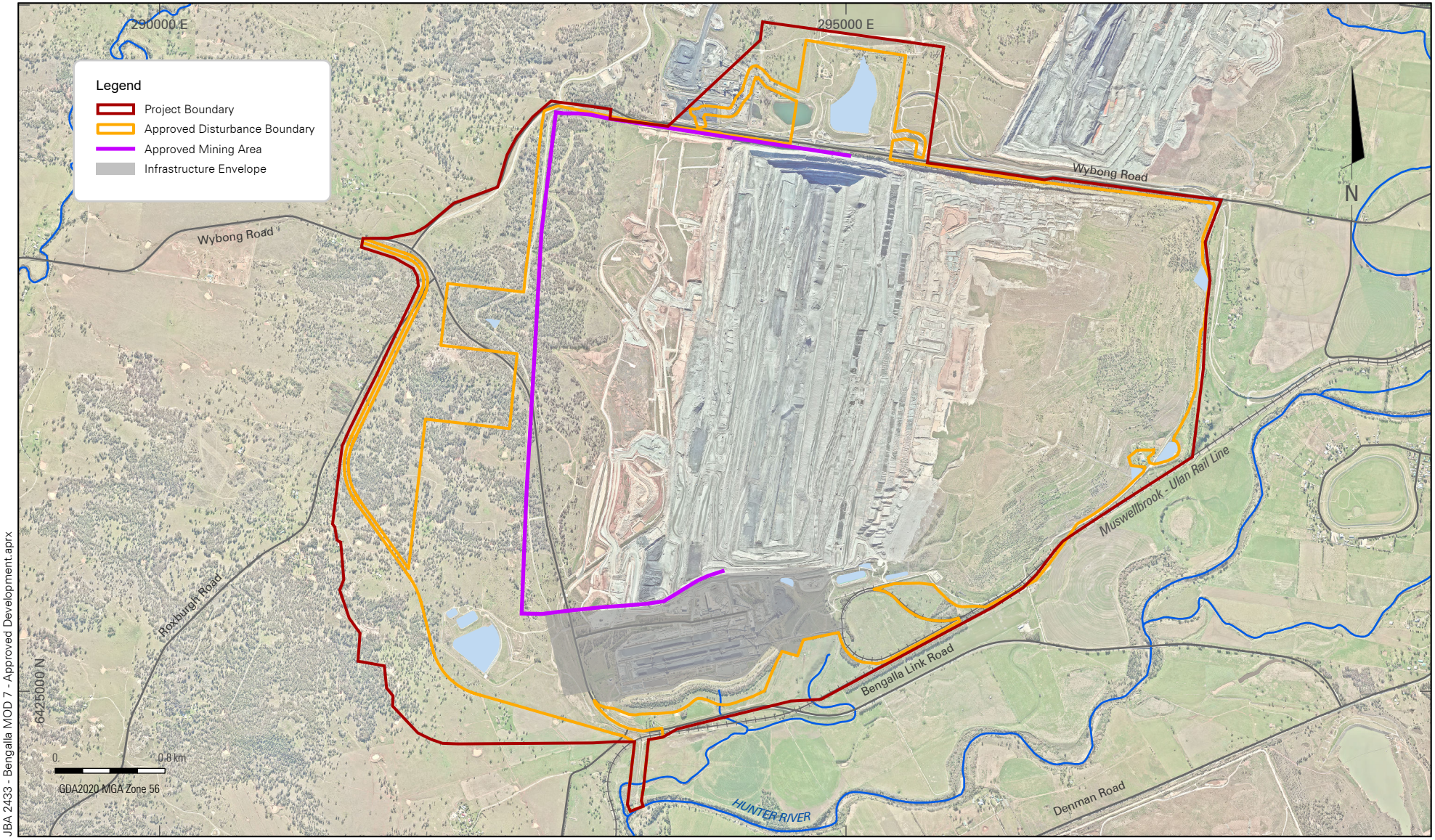
Figure 2 shows the existing development layout approved by SSD-5170 (as modified).

JBA 2433 - Bengalla MOD 7 - Regional Locality (28/11/2024)

BENGALLA MINE

Regional Locality

FIGURE 1



JBA 2433 - Bengalla MOD 7 - Approved Development.aprx

BENGALLA MINE MOD 7

Approved Development Layout

FIGURE 2

1.2 MODIFICATION OVERVIEW

BMC is seeking a Modification to facilitate the construction of a Temporary Overburden Emplacement Area (TOEA). The TOEA will temporarily stockpile approximately 11 Million loose cubic metres (Mlcm) of waste overburden material within the existing OEA footprint.

The Modification is described in detail in **Section 3**. The conceptual TOEA design proposed for the Modification is illustrated in **Figure 3**.

1.3 APPLICANT

The applicant is BMC which is owned by the Bengalla Joint Venture (BJV). The BJV consists of:

- New Hope Bengalla Pty Limited (a wholly owned subsidiary of New Hope Corporation Limited) – 80%; and
- Taipower Bengalla Pty Limited (a wholly owned subsidiary of Taiwan Power Company) – 20%.

The contact details for BMC are:

Bengalla Mining Company Pty Limited

Locked Mail Bag 5
MUSWELLBROOK NSW 2333

Phone: 02 6542 9500
Fax: 02 6542 9599
Website: https://newhopegroup.com.au/bengalla-mine/

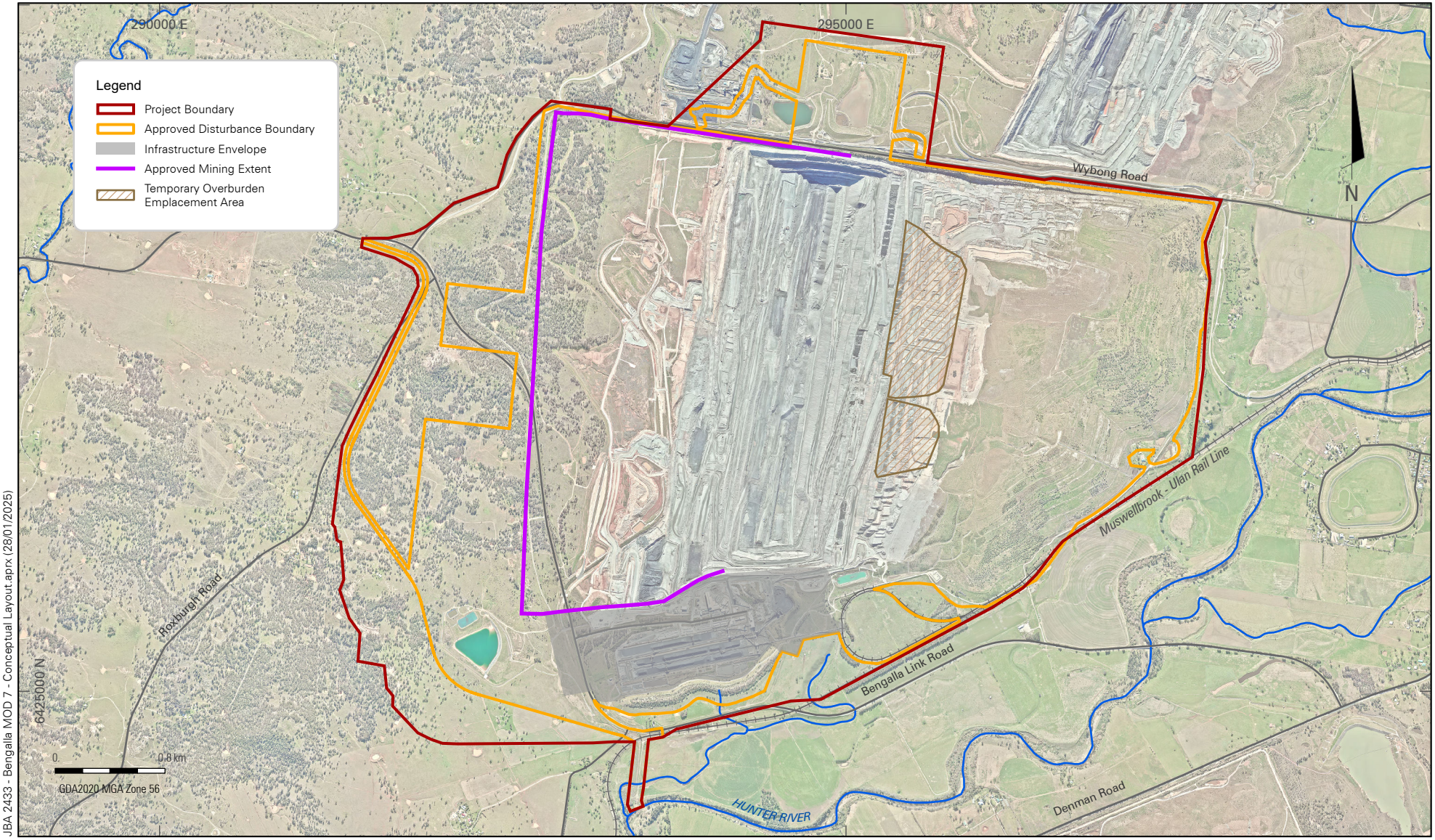
1.4 DOCUMENT PURPOSE

The applicant is seeking to modify SSD-5170 under section 4.55(2) of the EP&A Act to facilitate the construction of a TOEA. This Modification Report has been prepared to satisfy Clauses 99 and 100 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation), with regard to the '*State Significant Development Guidelines – Preparing a Modification Report*' (Department of Planning, Infrastructure and Environment, 2022).

1.5 DOCUMENT STRUCTURE

The Modification Report is structured as follows:

- **Section 2** outlines the relevant environmental and planning context for the Modification;
- **Section 3** provides a detailed description of the Modification;
- **Section 4** summarises the regulatory framework that is relevant to the Modification;
- **Section 5** summarises the stakeholder engagement conducted regarding the Modification and the issues raised by stakeholders;
- **Section 6** assesses the potential environmental impacts of the Modification and recommends mitigation measures to minimise these impacts; and
- **Section 7** evaluates the merits of the Modification.



BENGALLA MINE MOD 7

Conceptual Modification Layout

FIGURE 3

2. STRATEGIC CONTEXT

This section outlines the environmental and planning context that is relevant to the Modification. It identifies the surrounding environmental features, key planning considerations and relevant government policies.

2.1 SURROUNDING ENVIRONMENT

2.1.1 Regional Setting

Bengalla is located within the Muswellbrook Local Government Area (LGA), which has a mix of residential, agricultural and industrial land uses. The township of Muswellbrook is located approximately 4 km east of Bengalla. The Muswellbrook Industrial Estate is located on Thomas Mitchell Drive, approximately 4 km south east of Bengalla. Muswellbrook Industrial Estate includes a variety of businesses that provide support services to the mining and power generation industries.

Coal mining and associated power generation are prominent and long-standing land uses. The other coal mining and power generation operations in the LGA include Mount Pleasant Mine, Mt Arthur Coal Mine, Maxwell Underground Mine, Mangoola Mine and the Bayswater Power Station.

2.1.2 Topography

The land within the SSD-5170 Project Boundary (Project Boundary) is generally undulating sloping towards the Hunter River to the South. The local drainage network generally consists of relatively steep gullies draining from the surrounding hills into tributaries across the Hunter River floodplain.

2.1.3 Natural Features

Much of Bengalla's immediate locality consists of industry, farmland and remnant vegetation. The area within the Project Boundary has been previously subject to land clearing and is comprised of a patchwork of remnant native vegetation and grassland areas. Fauna habitat largely includes Derived Native Grasslands and to a lesser extent, regenerating woodland and open forest that have been partially thinned or cleared in the past by prior landuses.

The key natural feature in the vicinity of Bengalla is the Hunter River, which has a catchment of approximately 4,300 km^2 to Muswellbrook. The Hunter River is regulated by Glenbawn Dam. The main channel of the Hunter River meanders to the south of Bengalla, with a small portion of its floodplain being located within the Project Boundary.

Dry Creek is a 3rd order stream that flowed in a southerly direction through the centre of the Project Boundary. Dry Creek was an ephemeral tributary of the Hunter River and had a total catchment area of approximately 18 km^2. SSD-5170 authorises the temporary diversion of Dry Creek during mining operations. The temporary diversion has been completed and consists of a clean water dam (CW1) and a pump and pipeline system to capture and circulate clean runoff around the mining area. Dry Creek will be re-instated within rehabilitated land.

2.2 LAND OWNERSHIP

The major community in the locality is the township of Muswellbrook, located approximately 4 km east of Bengalla. The smaller community of Denman is located 15 km to the south-west. The ownership of land in the vicinity of Bengalla is illustrated in **Figure 4**.

Bengalla is adjoined to the north by the Mount Pleasant Mine (operated by MACH Energy Australia Pty Limited (MACH)). The Mt Arthur Coal Mine (operated by Hunter Valley Energy Coal Pty Ltd (HVEC)) is located to the south-east.

BJV/BMC owns all the freehold land within the Project Boundary except for some parcels north of Wybong Road which are owned by MACH. BMC holds Mining Lease (ML) 1711 in respect of its infrastructure in this area. MACH owns the land to the north of Bengalla and HVEC owns most of the land to the south. Several privately owned rural-residential properties are located immediately to the west of Bengalla.

2.3 LANDUSE PLANNING

Bengalla is located within the Muswellbrook Local Government Area (LGA). Bengalla is located on land zoned as RU 1 (Primary Production) and C3 (Environmental Management) under the *Muswellbrook Local Environmental Plan 2009* (Muswellbrook LEP). The permissibility of mining is discussed in **Section 4.2.2**.

Coal mining and associated power generation are prominent and long-standing land uses in the Bengalla locality. The other coal mining and power generation operations in the LGA include Mount Pleasant Mine, Mt Arthur Coal Mine, Maxwell Underground Mine, Mangoola Mine and the Bayswater Power Station.

Agricultural activities (predominantly grazing) are undertaken on rural properties in the LGA including on the majority of BJV/BMC's surplus landholdings. The major transport corridors in the locality are the New England Highway and the Main Northern Rail Line.

The township of Muswellbrook is located approximately 4km east of Bengalla. The Muswellbrook Industrial Estate is located on Thomas Mitchell Drive, approximately 4 km south of Bengalla. Muswellbrook Industrial Estate includes a variety of businesses that provide support services to the mining and power generation industries.

2.4 HAZARDS

2.4.1 Flood Prone Land

The southern extent of the approved Project Boundary is located within the floodplain of the Hunter River. The Bengalla rail loop is within the flood extent for a 1% annual exceedance probability (AEP) storm event, as modelled in the '*Hunter River Flood Study (Muswellbrook to Denman)*' (Worley Parsons, 2014). The open cut mining area and mine infrastructure area are located entirely outside of the modelled flood extent for all events up to and including the probable maximum flood (PMF).

The activities proposed by the Modification will be located outside of the PMF extent of the Hunter River.

2.4.2 Bushfire Prone Land

Bengalla is mapped as bushfire prone land. Bushfire prone land is categorised into three categories according to level of risk, namely:

- Vegetation Category 1 represents the highest bushfire risk and includes forests, woodlands, heaths and timber plantations;
- Vegetation Category 2 represents the lowest risk and includes rainforests, remnant vegetation and land that is actively managed; and
- Vegetation Category 3 is the most recently introduced category and falls between categories 1 and 2. Vegetation Category 3 includes grasslands and shrublands.

As shown in **Figure 5**, most of the land within the Project Boundary is mapped as Vegetation Category 3, although smaller areas of Vegetation Category 1 are present in the western extent of the site. Bengalla is equipped with first-response firefighting equipment and has an emergency response protocol which addresses notification of emergency services.

2.4.3 Mine Subsidence Districts

The eastern portion of the Project Boundary is located within the Muswellbrook Mine Subsidence District (MSD). As shown in **Figure 5**, this MSD applies to part of the rehabilitated OEA. No aspects of the Modification will be undertaken within this MSD.

2.4.4 Contaminated Lands

The Environmental Protection Authority (EPA) maintains a register of contaminated land in NSW. The Modification is not located on or near a notified contaminated site.

2.5 CUMULATIVE IMPACTS

The primary potential for any cumulative impacts resulting from the Modification relates to that of air quality and noise emissions. Assessments of cumulative air quality and noise impacts were conducted for the '*Continuation of Bengalla Mine Environmental Impact Statement*' (Hansen Bailey, 2013) (Bengalla EIS).

As described in **Section 6**, the potential air quality and noise emissions generated by the Modification are negligible in the context of the overall development and surrounding developments in the vicinity of Bengalla. The Modification will not result in any material additional contribution to the cumulative impacts of those developments.

2.6 PLANNING AGREEMENTS

BMC has entered into a Voluntary Planning Agreement (VPA) in accordance with the conditions of SSD-5170 (as modified). The VPA facilitates the community benefits listed in **Table 1**.

Table 1 Voluntary Planning Agreement with Muswellbrook Shire Council

Component	BMC Commitment
General contribution	$0.065 cents per tonne of product coal produced in excess of 8.5 Million tonnes (Mt) of product coal from the mine in any calendar year
Bengalla Coal Community Fund	$400,000 per annum
Road maintenance requirements within the Muswellbrook LGA	$125,000 per annum
Muswellbrook Shire Council Environmental Officer position	$20,000 per annum
A commitment to training of local apprentices	Four apprentices per annum sourced from the local area

The Modification will not result in any additional impacts on public infrastructure or services. As such, no variations to the existing VPA are proposed.

2.7 GOVERNMENT POLICIES AND PLANS

2.7.1 Hunter Regional Plan 2036

The '*Hunter Regional Plan 2041*' (NSW Government, 2022) (HRP) aims to guide the NSW Government's land use planning priorities and decisions over a period of 20years in the Hunter Region. It provides an overarching framework to guide subsequent and more detailed land use plans, development proposals and infrastructure funding decisions.

The HRP includes nine objectives. The strategies within each objective aim to set the policy positions and provide a preferred pathway for achieving the objective. If a planning proposal is not consistent with a strategy, performance outcomes listed with each objective provide the assessment framework that determines whether an alternative approach still achieves the objectives and vision of the HRP.

Objective 1 of the HRP is to diversify the Hunter's mining, energy, and industrial capacity. The objective acknowledges,

> '*The Hunter is an economic powerhouse, driven by the mining, energy and manufacturing sectors. These sectors will remain important contributors to the regional economy into the future, generating employment which sustains our communities*.'

The Modification will continue to achieve the relevant performance outcome:

> '1 *Power stations and coal mines facilitate diverse job opportunities on their land either during operation or following closure, with land uses responsive to the characteristics of the locality.'*

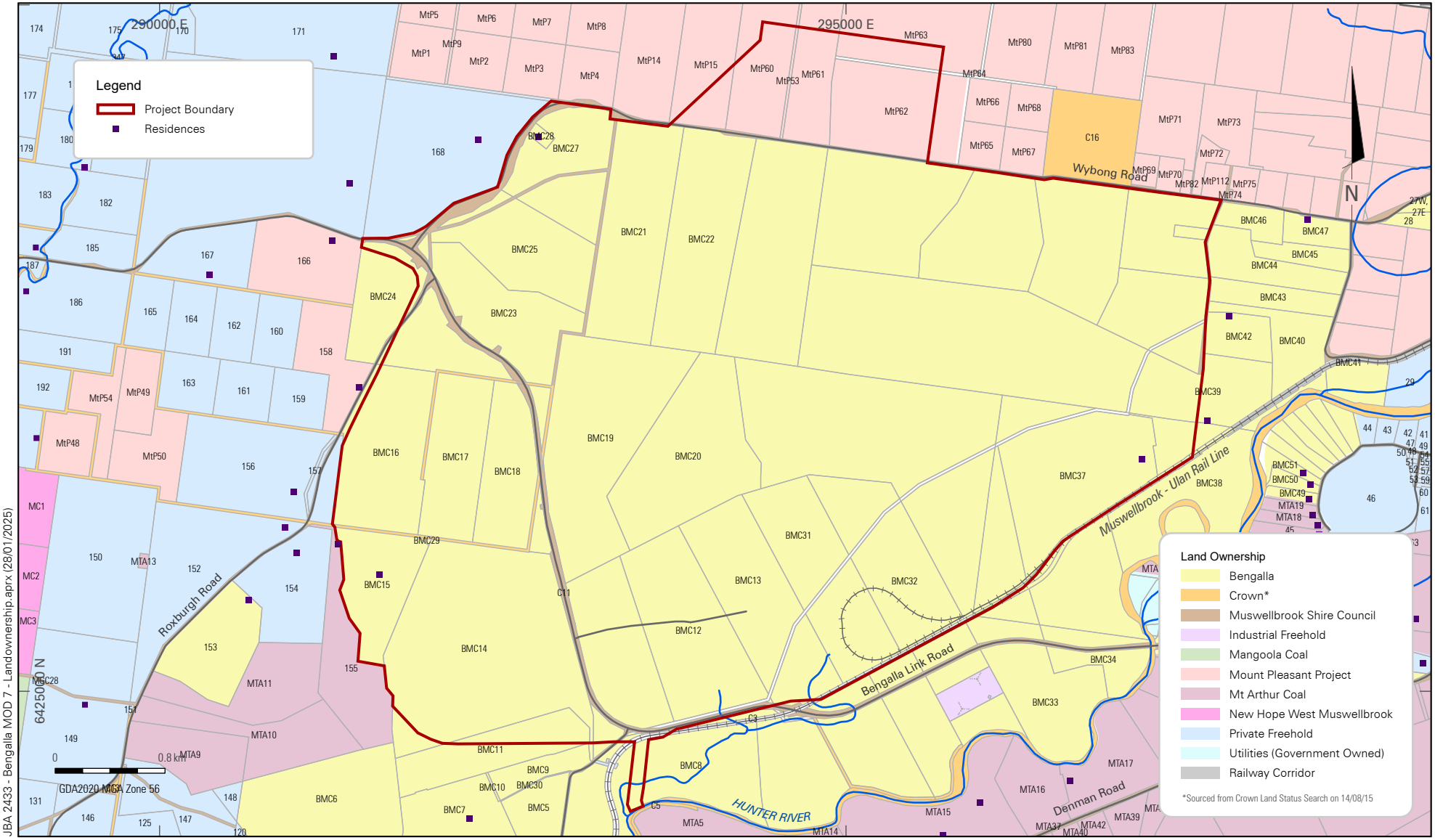
BCM will continue to provide employment for approximately 900 permanent employees and contribute to economic development in the region. The other objectives of the HRP are not relevant to the Modification.

2.7.2 Land Use Development Strategy

Muswellbrook Shire Council (MSC) has prepared the *Muswellbrook Shire 2022-2032 Community Strategic Plan* (MSC, 2022) (Community Strategic Plan) which outlines the future direction and vision for the Muswellbrook LGA over a 10 year period to 2032. The Community Strategic Plan confirms mining operations in the local Council area account for 75.8% of the regional exports. Mining and energy producers are identified as key contributors to assist in achieving the first goal of the Community Strategic Plan which is:

> *'A dynamic local economy with full employment for current and future residents in a diverse range of high value industries.'*

The Modification is aligned with the Community Strategic Plan as it aims to continue supporting opportunities for economic development and employment in the Muswellbrook LGA.

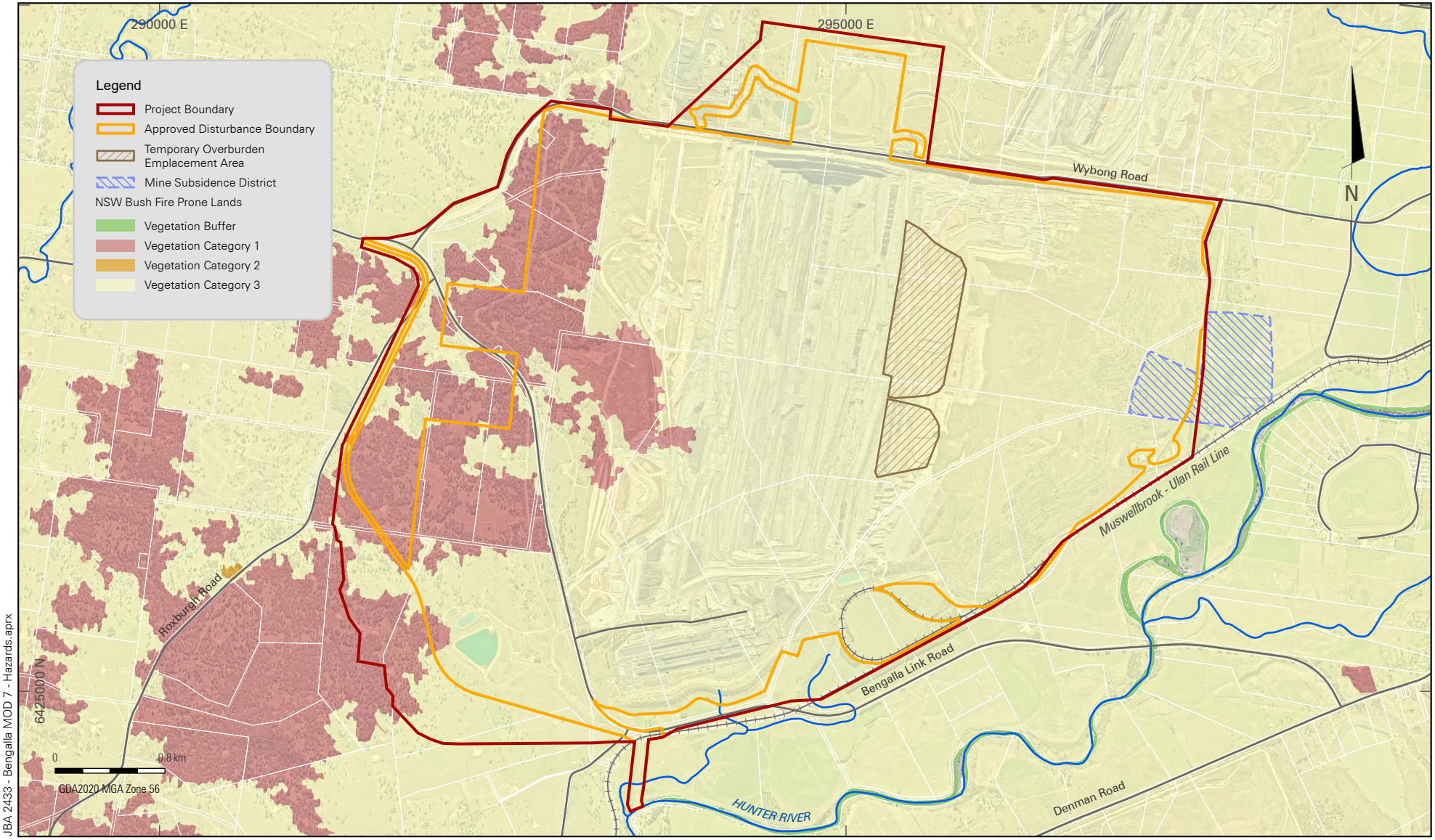


JBA 2433 - Bengalla MOD 7 - Landownership.aprx (28/01/2025)

BENGALLA MINE MOD 7

Landownership

FIGURE 4



BENGALLA MINE MOD 7

Bushfire Prone Land and Mine Subsidence District

FIGURE 5

3. MODIFICATION DESCRIPTION

This section provides a comprehensive description of the modification for which approval is sought. It also provides a justification and discussion on the alternatives considered.

3.1 OVERVIEW

BMC is seeking a Modification to facilitate the construction of a TOEA. The TOEA will temporarily stockpile approximately 11 Mlcm of waste overburden material within the existing OEA footprint. The conceptual TOEA design proposed for the Modification is illustrated in **Figure 3**.

As Bengalla progresses to the west, the approved conceptual final landform follows the natural topography and slopes gradually downwards to facilitate the future reinstatement of Dry Creek. The TOEA has been situated central to future landform establishment areas in a location shielded by the two Visual Relief Areas, which were designed to enhance the resemblance of a natural landform. While the interim landform will be approximately 25m higher than the approved final landform within the proposed TOEA footprint, it remains 20m lower than the maximum approved final landform height of RL300m.

The staged placement of overburden material within the TOEA will facilitate the optimal progression of mining operations whilst maintaining sufficient flexibility for the development of future amendments to the approved final landform. If the proposed landform improvements are not approved or developed, the surplus material would be rehandled into the final void to achieve the currently approved final landform by the end of mine life.

3.2 COMPARISON WITH APPROVED DEVELOPMENT

To facilitate the proposed activities, BMC seeks to modify the planning approval SSD - 5170. **Table 2** compares the components of the Modification to the currently authorised activities at Bengalla. The Modification involves a relatively minor temporary adjustment to the approved final landform at Bengalla. Accordingly, the Modification does not alter the character or scale of the approved development.

Table 2 Comparison of the Modification to the Approved Development

Aspect	Approved Development*	The Modification
Land use	Coal mining and ancillary activities	No change
Duration	Mining operations until 28 February 2039	No change
Mining method	Open cut mining using a dragline, excavators, truck fleet and ancillary equipment	No change
Production rate	Maximum production rate of 15 Mtpa of ROM coal	No change
Surface infrastructure	CHPP, rail loadout facility, offices, bathhouse, workshop, fuel storages, vehicle wash bays, powerlines, mobile crushing facility, access roads and water management infrastructure	No change
Water management	• Diversion of clean water around disturbed areas, primarily using the Western Diversion Levee • Capture and containment of mine-affected water in mine water dams. Mine water is reused for operational purposes (e.g. dust suppression, coal	No change

Aspect	Approved Development*	The Modification
	washing) wherever possible. If required, surplus mine water can be discharged in accordance with the HRSTS • Capture and treatment of sediment-laden water in sediment dams	
Final landform	Conceptual final landform is shown in Appendix 9 of SSD-5170	The landform within the TOEA footprint will be approximately 25m higher than the approved final landform, however it remains 20m lower than the maximum approved final landform height of RL300m
Operating hours	24 hours per day, 7 days per week	No change
Workforce	Maximum of 900 Full Time Equivalent personnel	No change

3.3 REASONS FOR THE MODIFICATION

Construction of the TOEA will enable BMC to temporarily stockpile waste overburden material in a central location within the Main OEA. The placement of material within the proposed TOEA location provides the opportunity for either the development of a proposed improved final landform (subject to further approval as required) or for the material to be later rehandled into the void to comply with the currently approved final landform.

3.4 ALTERNATIVES

3.4.1 The 'No Modification' Scenario

If approval of the Modification is not granted BMC would continue to operate as approved under SSD – 5170. Operational efficiency would be hampered by available waste (overburden, reject and tailings) emplacement space, resulting in increased haulage congestion and lower coal production. This would forego the potential future improvements to the final landform and may result in the sterilisation of identified coal resources within the currently approved Project Boundary.

As such, this would represent a missed opportunity for ongoing socio-economic benefits provided by Bengalla. The sterilisation of a readily available resource will present a reduction in royalties to NSW, revenue for the Federal government, continued employment opportunities and flow on benefits to the local community.

3.4.2 Modification Alternatives

Alternatives to the Modification that were considered by BMC included different locations and designs for the proposed TOEA. The proposed TOEA represents the preferred location in that it can be reasonably and feasibly constructed to:

- Avoid the need for disturbance outside of areas approved for development under SSD-5170;
- Avoid impacts to existing approved BMC operations and site infrastructure;
- Avoid disturbance to existing established rehabilitated land;
- Avoid potential impacts to sensitive receivers;
- Allow flexibility for the development of future amendments to the approved final landform; and
- Support any future construction of a proposed stable and free draining final landform.

4. STATUTORY CONTEXT

This section provides a summary of the legislative provisions that are relevant to the Modification.

4.1 OVERVIEW

Table 3 summarises the regulatory framework that is relevant to the Modification. The aspects of the regulatory framework that warrant greater analysis are discussed further in **Section 4.2**.

Table 3 Relevant Legislation Provisions

Aspect	Relevant Provisions	Applicability to Modification
Power to modify approval	Section 4.55(2) of the EP&A Act	If the Modification is granted, the modified development will be 'substantially the same development' as the development for which consent was originally granted (as explained in **Section 4.2.1**).
Permissibility	Muswellbrook LEP Clause 2.9(1)(b) of *State Environmental Planning Policy (Resources and Energy) 2021* (Resources & Energy SEPP)	The land within the Project Boundary is zoned as either RU1 Primary Production or C3 Environmental Management under the Muswellbrook LEP. Open cut mining is permissible on this land pursuant to Clause 2.9 (1)(b) of the Resources and Energy SEPP. Further detail is provided in **Section 4.2.2**.
Gateway process	Clause 103 of *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) Clause 2.24 of the Resources and Energy SEPP	The Modification does not fall within the definition of 'mining or petroleum development' because no new mining leases are required. Accordingly, the Gateway process does not apply to the Modification.
Matters for consideration	Section 4.55(3) of the EP&A Act Part 2.3 of the Resources and Energy SEPP	The consent authority must consider the matters under Section 4.15(1) of the EP&A Act that are relevant to the Modification. Part 2.3 of the Resources and Energy SEPP prescribes additional matters that must be considered for mining proposals.
Other Approvals	Section 48 of the *Protection of the Environment Operations Act 1997* (POEO Act)	BMC holds Environment Protection Licence (EPL) 6538 granted under the POEO Act, which will be applied to the proposed Modification. No changes to EPL 6538 are proposed for the Modification.
	Section 6 of the *Mining Act 1992*	The TOEA is located within existing mining authorities. The proposed changes to the OEA will be reflected in the Rehabilitation Management Plan to be prepared in accordance with the relevant Bengalla mining authorities.
	Section 7.7 of the *Biodiversity Conservation Act 2016* (BC Act)	The Modification will not result in additional biodiversity impacts to those approved under SSD - 5170 (as modified) and as such, a Biodiversity Development Assessment Report is not required.
	Section 68 of *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)	EPBC Act approval is not required for the Modification. The activities associated with the Modification will not impact on Matters of National Environmental Significance listed under the EPBC Act.

Aspect	Relevant Provisions	Applicability to Modification
	Heritage Act 1997 (NSW)	No listed places will be impacted by the Modification.
	National Parks and Wildlife Act 1974	An Aboriginal Heritage Impact Permit is required for any activity that may harm or desecrate an Aboriginal object. The Modification will not require any disturbance outside the approved Disturbance Boundary.
	Section 23C of the *Native Title Act 1993*	The Modification will not require any new mining leases or involve development on Crown land. All activities proposed by the Modification will be undertaken on land where native title has been extinguished.
	Water Management Act 2000	The construction of the TOEA will not require any changes to the Bengalla water licensing arrangements.

4.2 KEY LEGAL MATTERS

4.2.1 Power to Modify

Section 4.55(2) of the EP&A Act enables a consent authority to modify a development consent. This power to modify is governed by certain requirements including the need for the consent authority to be satisfied that the modified development is 'substantially the same development' as the original development (before any modifications) for which consent was granted.

The Modification will not result in any material change in any essential or important features of the approved development. Specifically, the following aspects will remain consistent with SSD-5170:

- Mining footprint and methods;
- Maximum coal production rate or total coal recovered;
- Maximum disturbance area;
- Method of coal transportation; and
- Hours of operations and size of the operational workforce.

In consideration of the quantitative and qualitative differences between the development as approved and the Modification in their proper context, the modified development meets the requirement of being 'substantially the same development'. Therefore, the consent authority may exercise its power under Section 4.55(2) of the EP&A Act to modify SSD-5170.

4.2.2 Permissibility

The land within the Project Boundary is zoned as either RU1 Primary Production or C3 Environmental Management. The land use table in the Muswellbrook LEP states that open cut mining is permissible with consent in zone RU1. The Muswellbrook LEP does not list open cut mining as permissible development within zone C3.

The permissibility of mining development is also prescribed by the Resources & Energy SEPP. Clause 2.9(1)(b) of the Resources & Energy SEPP states that mining can be carried out with development consent on any land where agriculture or industry is permissible (with or without development consent). The Muswellbrook LEP permits 'extensive agriculture' within zone C3. Therefore, mining is also permissible with development consent within zone C3 by virtue of Clause 29(1)(b) of the Resources & Energy SEPP.

5. STAKEHOLDER ENGAGEMENT

This section provides a summary of the stakeholder engagement undertaken for the Modification. The Modification does not propose any changes to any approved stakeholder engagement strategies or processes.

5.1 COMMUNITY ENGAGEMENT

Consultation with key community stakeholders was undertaken to inform them of the Modification. **Table 4** summarises the consultation undertaken. No issues were raised that required further assessment or material changes to the Modification.

Table 4 Community Engagement

Stakeholder	Method of Consultation	Issues Raised
Muswellbrook Shire Council (MSC)	Meeting at Council offices 11 April 2024	No issues raised that required further assessment or material changes to the Modification.
MSC	Meeting at Council offices 17 May 2024	No issues raised that required further assessment or material changes to the Modification.
Community Consultative Committee (CCC)	Meeting on 28 August 2024	No issues raised that required further assessment or material changes to the Modification.
Wider Community	Bengalla Mine Open Day on 26 October 2024	No issues raised that required further assessment or material changes to the Modification.
CCC	Meeting on 27 November 2024	No issues raised that required further assessment or material changes to the Modification.

5.2 REGULATORY CONSULTATION

In addition to community engagement, BMC consulted with the relevant regulatory authorities to ascertain matters for consideration and/or assessment. **Table 5** summarises the consultation undertaken with regulatory agencies, the issues raised and where those issues are addressed in this document.

Table 5 Regulatory Engagement

Stakeholder	Method of Consultation	Issues Raised
Department of Planning, Housing and Infrastructure (DPHI)	Meeting via Microsoft Teams on 13 March 2024	No issues raised that required further assessment or material changes to the Modification.
DPHI	Meeting via Microsoft Teams on 21 June2024	No issues raised that required further assessment or material changes to the Modification.
DPHI	Meeting via Microsoft Teams on 23 September 2024	Follow up meeting due to officer movements within the Department. No issues raised that required further assessment of material changes to the Modification.
Environmental Protection Authority (EPA)	Meeting Via Microsoft Teams on 21 October 2024	No issues raised that required further assessment or material changes to the Modification.
DPHI	Scoping letter submitted via email on 28 October 2024	No issues raised that required further assessment or material changes to the Modification. Email submission due to technical issues with the DPHI Major Projects Portal which were subsequently resolved.

6. IMPACTS, MANAGEMENT AND MITIGATION

This section outlines the potential environmental impacts of the Modification and describes the measures that will be implemented to mitigate these impacts.

6.1 AIR QUALITY

6.1.1 Background

An air quality assessment for the Modification was undertaken by Todoroski Air Sciences (TAS). The air quality impact assessment is provided in **Appendix A**. This assessment considered the activities proposed by the Modification that have the potential to generate additional dust emissions and associated air quality impacts. The impacts of the Modification are considered relative to those of approved Bengalla operations, which represented the baseline for this assessment. The air quality impacts of the approved mine were assessed in the Bengalla EIS, MOD1 SEE, MOD2 SEE, MOD4 SEE and MOD5.

The key components of the Modification from an air quality perspective are the increased height (and thus exposure) of a relatively small section of the approved OEA footprint and the likely dust generated from its potential rehandle back into the final void at the completion of mining.

6.1.2 Assessment of Impacts

The following activities associated with the Modification have the potential to generate dust:

- Initial emplacement of overburden material within the TOEA;
- Increased height of the TOEA, exposing a relatively small section of the overall overburden emplacement area to higher wind speed conditions;
- Marginal increase in haul route length; and
- The dust likely to be generated by the rehandle of the TOEA back into the final void at the completion of mining.

The assessment provides a comparison of the total annual dust emissions for approved Bengalla (as modified) and the Modification. It was determined dust emissions associated with the Modification will increase by approximately 0.36 - 0.43%. The air quality expert (TAS) concluded the Modification will not result in any discernible additional air quality impact at any receptor locations. With the implementation of appropriate dust controls, the proposed Modification activities are unlikely to generate significant dust emissions.

6.1.3 Mitigation

BMC implements a suite of dust management measures and controls in accordance with the approved Bengalla AQMP. These controls will continue to be implemented for the proposed Modification, including but not limited to:

- Proactive management of equipment fleet utilisation and placement in response to predicted weather conditions;
- Visual inspections to proactively reallocate water carts or mining equipment where required;
- Manage or restrict active dump locations in adverse weather conditions;
- Minimise drop height for dumping overburden materials;
- Moderate drop height from loading unit to truck trays;
- Adequate maintenance and demarcation of heavy vehicle trafficable areas and vehicle manoeuvring areas;

- Temporary stabilisation and seeding of exposed areas that cannot be progressively rehabilitated where reasonable and feasible; and
- Application of dust suppression on haul roads, and further speed restrictions should sustained elevated visible dust levels occur.

6.2 NOISE

6.2.1 Background

An Acoustic Review was undertaken by Bridges Acoustics and is provided in **Appendix B**. This assessment considered the activities proposed by the Modification that have the potential to generate additional noise emissions and associated impacts. Relevant to the noise assessment, it is noted that the elevated areas of the developed OEA will shield the TOEA from the sensitive receptors to the east of Bengalla and the proposed landform will remain 20m lower than the maximum approved final landform height of RL300m.

6.2.2 Assessment of Impacts

The construction of the TOEA may include the following noise generating activities:

- Loading of overburden material within the pit;
- Hauling of overburden material to the Main OEA by truck; and
- Placement of overburden material within the existing OEA footprint at a higher elevation in the approximate centre of the operation.

The Modification does not propose to change the existing equipment fleet, mining method, intensity, or duration of approved operations. Construction of the proposed TOEA west of the existing OEA would likely result in:

- Reduced noise levels at sensitive receptors in the east in comparison to previous years, as mining equipment will be less exposed and at a greater distance from noise generating activities; and
- As mining operations advance westward, receptors to the southwest and west of Bengalla are expected to experience marginally higher average noise levels. The TOEA will be similarly exposed and positioned slightly closer to these receptors compared to current and recent mining activities.

Given the context of existing Bengalla operations, it is unlikely that the Modification would result in significant noise impacts in addition to those approved under SSD-5170.

6.2.3 Mitigation

BMC has implemented an approved NMP in accordance with the conditions of SSD-5170. The potential noise impacts of the Modification will be minimised through the following measures:

- Mobile equipment is operated and maintained to manufacturer's specification;
- Mobile equipment generally operate on elevated and exposed sections of the OEA during the day and on lower and more shielded sections of the OEA during evening periods;
- Dozers operating in elevated areas use low gear only; and
- Noise attenuation is installed on the mobile equipment fleet where available, with a focus on continuous improvement of sound power performance to achieve best practice noise attenuation on haul trucks; and
- Implementation of appropriate reactive noise controls in response to noise monitoring trigger levels.

6.3 VISUAL

6.3.1 Background

A Visual Impact Assessment has been undertaken for the Modification and is provided in **Appendix C**. The purpose of the assessment was to identify the character of the existing surrounding visual landscape and to quantify any additional visual impacts associated with the Modification when considered against the existing approved Bengalla visual elements.

The visual impacts of Bengalla were assessed in the Bengalla EIS, MOD2 SEE, MOD4 SEE and MOD5.

6.3.2 Assessment of Impacts

It was determined that the visibility and sensitivity to the Modification varies within the view sectors. Detailed topographic cross sections confirmed:

- The Modification will not be visible from the Northern and Eastern View Sectors due primarily to screening provided by the rehabilitated OEA;
- Viewing locations in the Southern View Sector are associated with the western portion of Denman Road and some limited rural residences with existing views to the southern edges of the extraction area and Main OEA; and
- Existing receivers within the most exposed Western View Sector include limited residences and users of minor roads. These viewing locations are mitigated by distance and frequently interrupted by topography and vegetation.

The Modification will not result in an increase in visual sensitivity as the vertical elevation of the proposed TOEA landform is lower in the viewshed than the currently constructed OEA. As such it is unlikely to become visible to more viewing locations that would not experience views of the Main OEA under approved operations.

The visual effects of the Modification were assessed to be low for the limited viewing locations in the western and south-western view sectors. A significant portion of the landscape in this locality is dominated by existing active mine areas and OEAs. The TOEA elements are consistent in form, shape, pattern and colour with the Main OEA. The TOEA is located within the active face of the Main OEA and in the broader visual context of the approved Bengalla, the difference will be a minor percentage of overall viewshed. The TOEA is considered to be visually contiguous with the currently approved OEA.

The visual impacts associated with the Modification were assessed to be low. Impacts will remain consistent with approved Bengalla operations due to:

- Relatively small scale of the TOEA landform in relation to the existing Main OEA and surrounding mining operations;
- Visual effects are consistent with the existing approved Bengalla landform; and
- The TOEA landform being screened by the approved and rehabilitated OEA and other topographic features from most sensitive viewing locations.

6.3.3 Mitigation

As the Modification will not result in any additional material impact on the surrounding visual landscape at any viewing location, no additional mitigation or management measures are required beyond those outlined in the Bengalla EIS and SSD-5170.

BMC has implemented a range of existing management measures to mitigate the visual impacts of Bengalla in accordance with the Visual Impact Management Plan and Rehabilitation Management Plan. The following on site rehabilitation and visual screening treatments will continue to be maintained:

- The installation of dense woody vegetation across the eastern face of the Main OEA exposed to Muswellbrook and Denman Road;
- Early, progressive establishment and rehabilitation of the outer faces of the Main OEA, particularly the southern slopes adjacent to the Main Northern Rail Line;
- Temporary stabilisation and seeding of exposed areas that cannot be progressively rehabilitated where reasonable and feasible; and
- Maintenance of existing tree planting and visual screening measures.

7. MERIT EVALUATION

This section provides a justification and evaluation, integrating the findings of previous sections to weigh up the positive and negative impacts of the Modification.

7.1 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The objects of the EP&A Act include facilitating "*... ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment*" (Section 1.3(b)). "*Ecologically sustainable development*" (ESD) has the same meaning as in Section 6(2) of the *Protection of the Environment Administration Act 1991*. **Table 6** lists the four principles of ESD and explains how the Modification satisfies these principles.

Table 6 Principles of Ecologically Sustainable Development

Principle	Application of the Modification
The precautionary principle—namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.	The Modification will not result in any threats of serious or irreversible environmental damage and that any environmental impacts can be appropriately minimised and managed by the mitigation measures described in this report. Potential environmental impacts of the Modification have been assessed using the best scientific methods available.
Inter-generational equity—namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.	SSD-5170 and the proposed Modification provides thermal coal which is required to meet the energy needs of the current generation as is evident by the demand for coal both within Australia and internationally. Upon completion of mining, disturbed areas will be rehabilitated to enable future generations to use the land, potentially for alternative energy sources. This will not change as a result of the Modification.
Conservation of biological diversity and ecological integrity—namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.	Disturbed areas at Bengalla will be rehabilitated to a mixture of woodland and pasture. In addition, BMC has established biodiversity offset areas in accordance with Schedule 3, Condition 26 of SSD-5170. This will not change as a result of the Modification.
Improved valuation, pricing and incentive mechanisms—namely, that environmental factors should be included in the valuation of assets and services.	The Modification is consistent with the 'polluter pays' principle for the following reasons: • The proponent (i.e. BMC) bears the cost of all environmental controls, including monitoring and biodiversity offsets; and • The proponent compensates for its social impacts through its VPA and other contributions (including mining royalties and company tax).

For the reasons described above, the Modification is consistent with the object of the EP&A Act relating to ESD. The Modification will also promote other objects of the EP&A Act including "*to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources*" (section 1.3(a)) and "*to promote the orderly and economic use and development of land*" (section 1.3(c)).

7.2 MERIT EVALUATION

Bengalla is approved by SSD-5170, which was granted by the Secretary of the then Department of Planning and Environment (DP&E) following a review by the NSW Planning Assessment Commission. In its determination of the Project, DP&E (2015) concluded that:

> *"The Department has carefully weighed the impacts of the project against the significance of the resource and the social and economic benefits. On balance, the Department believes that the project's benefits outweigh its residual costs, and that it is in the public interest and should be approved, subject to stringent conditions".*

As explained in **Section 2.7**, the Modification is consistent with the relevant environmental planning instruments and government plans/policies. A key theme of the relevant government plans/policies is to minimise land use conflict. The Modification will occur within the approved SSD_5170 disturbance boundary and will not materially increase the environmental impacts of the approved Bengalla development. Accordingly, the Modification will not result in any additional land use conflict.

Specialist assessments have been undertaken to support this Modification Report, including a Noise Review and Air Quality and Visual Impact Assessments. The findings of these environmental assessments are summarised in **Section 6.** These environmental assessments have not identified any material additional environmental impacts from the Modification which are not able to be appropriately managed.

Given that the Modification will not materially increase the environmental impacts of the operation, the benefit of Bengalla (as described in the Bengalla EIS and subsequent assessments) will continue to outweigh its social and environmental costs.

The Modification will realise improved outcomes for BMC, including:

- Efficient progression of mining operations;
- Prevent the sterilisation of a readily available resource with significant socio-economic benefits; and
- Allow flexibility for the development of future amendments to the approved final landform.

For these reasons, the Modification remains in the public interest, as it will not significantly alter the merits of the currently approved development.

REFERENCES

- Bengalla Mining Company Pty Ltd (2023), *Noise Management Plan.*
- Bengalla Mining Company Pty Ltd (2022), *Air Quality Management Plan.*
- Bengalla Mining Company Pty Ltd (202), *Rehabilitation Management Plan.*
- Department of Planning, Infrastructure and Environment (2021a), *State significant development guide – preparing a modification report.*
- Department of Planning, Infrastructure and Environment (2021b), *State significant development guide – preparing an environmental impact statement.*
- Hansen Bailey (2013), *Continuation of Bengalla Mine Environmental Impact Statement*.
- Hansen Bailey (2014), *Continuation of Bengalla Mine Response to Submissions*'.
- Hansen Bailey (2015a), *Bengalla Mine Development Consent Modification Statement of Environmental Effects*.
- Hansen Bailey (2015b), *Bengalla Mine Development Consent Modification Response to Submissions*.
- Hansen Bailey (2016a), *Bengalla Mine Development Consent Modification Statement of Environmental Effects.*
- Hansen Bailey (2016b), *Bengalla Mine Development Consent Modification 2 Response to Submissions*.
- Hansen Bailey (2016c), *Bengalla Mine Development Consent Modification 3 Statement of Environmental Effects*.
- Hansen Bailey (2016d), *Bengalla Mine Development Consent Modification 3 Response to Submissions*.
- Hansen Bailey (2017), *Bengalla Mine Development Consent SSD-5170 Modification 4 Statement of Environmental Effects*.
- Hansen Bailey (2018), *Bengalla Mine Development Consent Modification 4 Response to Submissions.*
- Muswellbrook Shire Council (2015), *Land Use Development Strategy*.
- NSW Government (2016), *Hunter Regional Plan 2036.*
- Rural Fire Service (2019), *Planning for Bush Fire Protection*.
- Worley Parsons (2014), *Hunter River Flood Study (Muswellbrook to Denman)*.

ABBREVIATIONS

Abbreviation	Meaning
AHD	Australian Height Datum
AQMP	Air Quality Management Plan
Bengalla EIS	Environmental impact statement titled '*Continuation of Bengalla Mine, Environmental Impact Statement'* (6 volumes), dated September 2013, as modified by the *Response to Submissions* dated March 2014
BJV	Bengalla Joint Venture
BMC	Bengalla Mining Company Pty Limited
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
DA	Development Application
DAWE	Department of Agriculture, Water and the Environment
dB(A)	A-weighted decibels
DRG	Department of Planning, Industry and Environment – Division of Resources and Geoscience
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning & Assessment Act 1979*
EPBC Act	*Environment Protection & Biodiversity Conservation Act 1999*
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ha	hectare
JBA	James Bailey & Associates (now part of Xenith Consulting)
LEP	Local Environmental Plan
LGA	Local Government Area
M	metres
Mbcm	Million bank cubic metres
Mlcm	Million loose cubic metres
ML	Mining Lease
MNES	Matters of National Environmental Significance
MOD	Modification
MSD	Mine Subsidence District
Mtpa	Million tonnes per annum
NSW	New South Wales
NT Act	*Native Title Act 1993*
OEA	Overburden Emplacement Area
Planning Systems SEPP	*State Environmental Planning Policy (Planning Systems) 2021*

Abbreviation	Meaning
POEO Act	*Protection of the Environment Operations Act 1997*
RAPs	Registered Aboriginal Parties
Resources & Energy SEPP	*State Environmental Planning Policy (Resources and Energy) 2021*
RL	Reduced Level
RMS	Roads and Maritime Services
ROM	Run of Mine
SEE	Statement of Environmental Effects
SEP	Stakeholder Engagement Plan
SPLs	Sound Power Levels
SSD	State Significant Development
TOEA	Temporary Overburden Emplacement Area

APPENDIX A

AIR QUALITY ASSESSMENT

TODOROSKI AIR SCIENCES
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18 February 2025

Lily Webster
Principal
Xenith

Via email: lily.webster@xenith.com.au

Dear Lily

RE: Air Quality Assessment – Bengalla Temporary Overburden Emplacement Area (TOEA)

Todoroski Air Sciences has conducted an air quality review of the proposed Temporary Overburden Emplacement Area (TOEA) at the Bengalla Coal Mine (Bengalla), hereafter referred to as the Modification.

This report investigates the likely change in dust emissions associated with the Modification relative to the approved Bengalla. The report has been prepared with consideration of the New South Wales (NSW) Environment Protection Authority (EPA) *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2022**).

Overview

Bengalla is an open cut coal mine located approximately 4 kilometres (km) west of Muswellbrook in the Upper Hunter Valley of NSW. It is operated by Bengalla Mining Company Pty Limited (BMC) in accordance with State Significant Development (SSD) 5170 (as modified) granted under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

BMC is seeking approval to modify SSD-5170 under Section 4.55(2) of the EP&A Act to facilitate a TOEA within the existing Overburden Emplacement Area (OEA) footprint.

A qualitative assessment has been conducted to determine the potential dust emissions and associated air quality impacts with the Modification relative to the approved Bengalla.

Modification Description

The TOEA will temporarily stockpile approximately 11 Million loose cubic metres (Mlcm) of overburden material within the existing OEA footprint. The resulting landform would be approximately 25 metres (m) higher than the approved landform at this location.

A conceptual TOEA design is illustrated in **Figure 1**.

The TOEA has been situated central to future landform establishment areas in a location shielded by the two Visual Relief Areas (the Northern Relief Area [NRA] and the Southern Relief Area [SRA]), approved per MOD2 which were designed to enhance the resemblance of a natural landform. While the interim landform will be approximately 25m higher than the approved final landform within this area, it remains 20m lower than the maximum approved final landform height of RL300m.

The staged placement of overburden material within the TOEA will facilitate the efficient progression of mining operations while maintaining sufficient flexibility for the development of future amendments to the approved final landform. This material will be rehandled into the final void to ensure that the currently approved final landform is achieved if the proposed landform improvements are not realised.

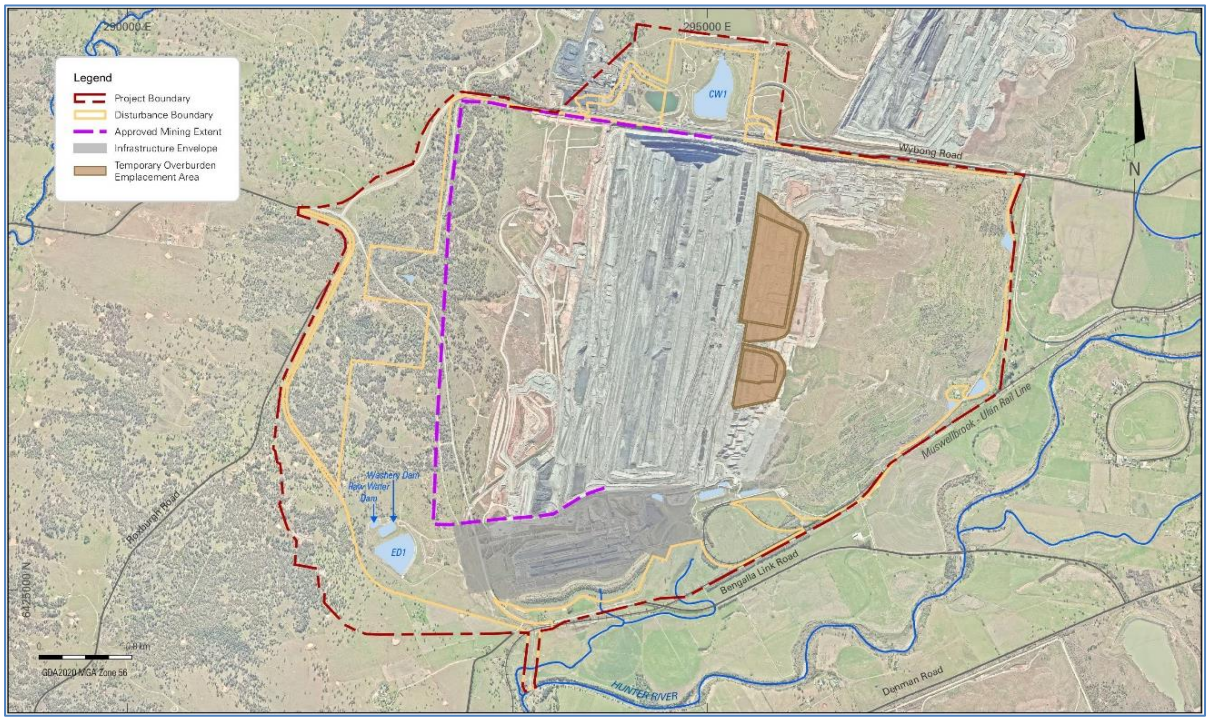

Figure 1: Project Indicative Site Layout

Assessment of Potential Air Quality Impacts

The key factors considered that may affect dust levels due to the Modification include the potential for more dust to be generated under higher wind speed conditions at higher elevations, the extent of exposed areas, the layout or spread of dust generating sources and their relative proximity to receptors, the material quantities handled and the staging or timing and location of the mine progression when these impacts arise.

The maximum terrain height for the Modification would be higher relative to the approved landform shape in this location. Wind speeds tend to be slightly stronger at a greater height and wind sensitive activities occurring at the more elevated peaks in the new landform would generate slightly more dust during their formation. However, greater wind speeds also result in better dust dispersion. It is also noted that the change in landform due to the Modification may result in terrain shielding, whereby the potential for wind erosion is reduced.

Increases to the exposed areas would result in more wind generated dust. As the TOEA is within the existing OEA footprint, any changes in the extent of exposed area due to the proposed landform configuration would likely be minimal. Similarly, as the location of activities associated with the TOEA compared with the approved

OEA (e.g. haul routes) are not proposed to be changed, the separation distance between these dust generating activities and sensitive receptors would not be significantly altered.

The increase in height of the emplacement area by 25m, would result in a slightly longer haul length. To quantify the potential additional dust associated with the longer haul length, we have estimated this by assuming a 10% gradient to reach the 25m height results in an approximate, 250m increase in haul road length (0.5 km return). Using the same emission factors as applied in previous air quality assessments for Bengalla, the additional dust associated with the hauling is calculated to be approximately 34,917 kg of TSP. Details of the emission estimation calculation are presented in **Appendix A**.

This increase in dust emissions has been compared to the approved dust emissions for Bengalla as presented in the *Air Quality Assessment – Bengalla Mine Development Consent Modification 5* (**Todoroski Air Sciences, 2021**).

A comparison of the estimated total annual dust emissions for Bengalla operations (as modified) and the Modification is presented in **Table 1**. It is important to note that the TOEA would not be operational for the full duration of the mine's lifespan but would be used as needed for short-term periods, i.e., approximately a year. The Modification's emissions have been compared to all mine year scenarios in order to assess the potential air quality impacts in any given year.

Table 1: Comparison of estimated TSP emission rate for the Modification (kg/year)

Scenario	Bengalla operations (as modified)	Modification	Percent of total dust emissions
Year 8	8,055,209	34,917	0.43%
Year 15	8,777,549	34,917	0.40%
Year 24	9,814,431	34,917	0.36%

It is calculated that the net total annual dust emissions associated with the Modification would increase dust emissions by approximately 0.36-0.43% relative to the approved Bengalla operations. This change in dust emissions is negligible and would not result in any discernible change in air impacts at sensitive locations.

In addition, the TOEA would be seeded to promote soil stabilisation, further minimising potential air emissions, such as those from wind erosion. As a result, the overall potential emissions from the TOEA would likely be lower.

Furthermore, it is understood that there is no proposed change to the approved production schedule for overburden tonnage rates associated with the Modification and thus, all other activities would remain the same.

If future proposed landform improvements are not implemented, the material in the TOEA will be rehandled and placed into the final void to ensure the approved final landform is achieved. This activity would occur during the decommissioning and rehabilitation phase for Bengalla. The Continuation of Bengalla Mine Environmental Impact Statement (EIS) (**Hansen Bailey, 2013**) identifies that approximately 14Mlcm of material is required for the rehabilitation of the final void. The material from the TOEA would be used as a substitute for sourcing material from elsewhere. The expected total dust generated from this activity would be similar to that associated with the rehabilitation activities and is not anticipated to exceed the scenarios assessed in the EIS, and therefore no additional air quality impacts are expected to arise from this activity.

Summary and Conclusions

This assessment has examined the likely air quality effects resulting from the proposed changes associated with the TOEA. The assessment estimates that activities associated with the Modification would see a potential increase in dust emissions by approximately 0.36 to 0.43% relative to the approved total dust emissions for Bengalla.

Overall, the change in dust emissions is unlikely to be noticed relative to the existing air quality surrounding the site and with the ongoing active dust management measures in place would ensure potential for dust impacts are low. It can be concluded that the proposed operation of the TOEA is not expected to result in any discernible impact above what is already approved at any receptor locations.

Please feel free to contact us if you would like to clarify any aspect of this report.

Yours faithfully,
Todoroski Air Sciences.

Emilie Aragnou

Katie Trahair

References

Hansen Bailey (2013)

"Continuation of Bengalla Mine Environmental Impact Statement", prepared by Hansen Bailey, September 2013.

NSW EPA (2022)

"Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales", NSW Environment Protection Authority, August 2022.

Todoroski Air Sciences (2021)

"Air Quality Assessment – Bengalla Mine Development Consent Modification 5", prepared by Todoroski Air Sciences, October 2021.

Appendix A – Emissions Inventory

Activity	TSP emission (kg/y)	PM10 emission (kg/y)	PM2.5 emission (kg/y)	Intensity	Unit	EF – TSP/PM_{10}/ $PM_{2.5}$	Units	Var1	Units	Var2	Unit	Var3	Unit	Var4 – TSP/ PM_{10}/$PM_{2.5}$	Unit	Var5	Units	Var6	Units
Hauling to emplacement	34,917	7,990	799	24,200,000	t/yr	0.0096 / 0.0022 / 0.0002	kg/t	209	t/l	281	vehicle gross (t)	0.5	km/return	4.0 / 0.9 / 0.1	kg/VKT	2.8	% S.C	85	% C

EF = emission factor, S.C = silt content (%), t/l = tonnes per load (t), t/yr = tonnes per year (tpa), VKT = vehicle kilometres travelled (km), C = control (%), km = kilometres

APPENDIX B

NOISE REVIEW

BRIDGES ACOUSTICS

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PATERSON NSW 2421

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bridgesacoustics@gmail.com

13 February 2025
Ref: J0254-25-L1

Xenith Consulting Pty Ltd
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157-159 John Street
SINGLETON NSW 2330

Attn: Ms Lily Webster

Dear Lily,

RE: BENGALLA MINE –

TEMPORARY OVERBURDEN EMPLACEMENT AREA MODIFICATION

1. INTRODUCTION

Bengalla Mining Company Pty Limited (BMC) operates Bengalla Mine (Bengalla) in the Upper Hunter Valley of NSW. Bengalla is operated in accordance with State Significant Development (SSD) 5170 (as modified) granted under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

BMC is proposing to modify SSD-5170 under Section 4.55(2) of the EP&A Act to facilitate a Temporary Overburden Emplacement Area (TOEA) within the existing Overburden Emplacement Area (OEA) footprint (Modification).

This assessment and report have been commissioned by Xenith Consulting on behalf of BMC to identify any acoustic impacts associated with the Modification and recommend mitigation measures to minimise such impacts.

2. MODIFICATION DESCRIPTION

BMC is seeking a Modification to facilitate the construction of a TOEA. The TOEA will temporarily stockpile approximately 11 Million loose cubic metres (Mlcm) of overburden material within the existing OEA footprint. The conceptual TOEA design proposed for the Modification is illustrated in Figure 1.

As Bengalla progresses to the west, the approved conceptual final landform follows the natural topography and slopes gradually downwards to facilitate the future reinstatement of Dry Creek. The TOEA has been situated central to future landform establishment areas in a location shielded by the two Visual Relief Areas, which were designed to mimic a natural landform. While the interim landform including the TOEA will be approximately 25m higher than the approved final landform within this area, it remains 20m lower than the maximum approved final landform height of RL300m.

The staged placement of overburden material within the TOEA will facilitate the efficient progression of mining operations while maintaining sufficient flexibility for the development of future amendments to the approved final landform. This material will be rehandled into the final void to ensure that the currently approved final landform is achieved if the proposed landform improvements are not realised.

BENGALLA MINE

Conceptual Modification Layout

FIGURE 1

JAMES BAILEY & ASSOCIATES
Environmental and Planning Consultants

BENGALLA

3. ASSESSMENT

3.1 Closest Receptors and Noise Criteria

Nearest noise sensitive receptors in each direction from Bengalla and their approximate distance from the TOEA are identified in Table 1, excluding receptors owned by or subject to acquisition by BMC or another mining company.

Table 1: Nearest Privately-Owned Receptors and Noise Criteria

Receptor ID, Location	Distance, Direction	Noise Criteria LAeq,15min, Day – Evening – Night
27, 419 Wybong Road	4.2 km North-east	35 – 35 – 35
29, 154 Logues Lane	3.3 km East	35 – 35 – 35
109, 1312 Denman Road	6.1 km South-west	40 – 40 – 40
149, 458 Roxburgh Road	6.0 km South-west	35 – 35 – 35
167, 1431 Wybong Road	5.2 km West	38 – 38 – 35

Table 1 shows receptors are only located generally east and west of Bengalla. No sensitive receptors are located in other directions due to Mount Pleasant Mine operating to the north and Mount Arthur Mine operating to the south.

3.2 Existing Bengalla Noise Levels

Noise levels from Bengalla are currently monitored for compliance with the SSD 5170 noise criteria on a monthly basis at three representative locations:

- AN01: Near Receptor 167 on Wybong Road to the west;
- AN03: Near Receptor 109 on Denman Road to the south-west; and
- AN04: Near Receptor 44 on Racecourse Road and south of Receptor 29 on Logues Lane to the east.

Attended noise monitoring is completed over 15 minute periods at night. Noise monitoring over the last five years has shown no breaches of the SSD-5170 noise related conditions in Table 1 at any location when assessed to the procedure detailed in Section 6.2 of the Bengalla Mine Noise Management Plan.

3.3 TOEA Operations

Use of the TOEA will initially include haul trucks placing overburden material and intermittent use of a dozer and grader to shape that material and ensure appropriate roads and other surfaces for truck access. Trucks, the dozer and grader will visit the TOEA in lieu of visiting other sections of the OEA. Depositing material within the TOEA will therefore not require additional mining equipment or additional equipment movements or operating hours.

Should material from the TOEA be rehandled to the final void in the absence of an approved amendment to the OEA, this would necessarily occur near the end of mining as last coal is removed from the final void and the mining fleet is progressively reducing near the end of mine life. No additional mining equipment will be required to rehandle material as there will be sufficient capacity in the existing equipment fleet during the ramp-down period.

3.4 TOEA Noise Levels to the East

Noise levels from mining operations are reducing each year due to the increased depth of mining and increased shielding by the developing OEA. Compared to the most elevated point within the existing

approved OEA, the TOEA will be located further west and at a lower elevation. The OEA will continue to shield receptors east of Bengalla from mining equipment noise, including operations associated with the TOEA. Noise from Bengalla, including equipment working within the TOEA, is unlikely to exceed noise levels in the years immediately prior to establishment of the TOEA.

As active and reactive noise management measures have been employed at Bengalla from the commencement of mining, such measures have adjusted to changes in the equipment fleet and the average exposure of mining equipment to receptors. Earlier years required substantial management to avoid exceeding the noise criteria while more recent years have on average required less frequent reactive management measures. While average noise levels at receptors to the east have decreased over time, noise levels continue to be limited by implementing appropriate management measures. As such, compliance with the noise criteria has been maintained as the mine progresses to the west and the OEA elevation increases.

Shielding of the proposed TOEA behind the already developed elevated sections of the OEA will mean little additional noise management will be required to avoid exceedances of the noise criteria as the TOEA is developed. Average noise levels will continue to decrease, although at a slightly lower rate until the TOEA is completed, and highest noise levels will continue to be managed as required.

Later operations to either redistribute and shape TOEA material into the final OEA or to rehandle the TOEA material into the final void will similarly occur behind the highest existing area of the OEA and remain shielded from eastern receptors. Such operations will therefore produce lower average noise levels than recent mining operations and require less active management measures to avoid exceedances of the noise criteria.

Given the success of active and reactive management measures in recent years as evidenced by compliance with SSD-5170 noise criteria, and BMC's commitment to continue and evolve management measures in the future, the proposed TOEA is not expected to increase the risk of exceeding the noise criteria at receptors.

3.5 TOEA Noise Levels to the West and South-West

The TOEA will be located west of and at a lower elevation than the currently approved rehabilitated peak of the OEA. Equipment operating on the TOEA will therefore be similarly exposed and slightly closer to receptors to the west and south-west of Bengalla, resulting in slightly higher average noise levels than current and recent mining operations in those areas.

However, the TOEA is substantially more remote from these receptors than the currently approved final extent of the OEA and active mining areas that are yet to be developed. Detailed noise assessments have consistently shown the highest noise levels to these receptors are predicted in the last few years of mining, as this period includes some mining equipment operating in areas exposed to receptors and the lowest setback distances from the mining area to receptors.

While average noise levels are predicted to increase over time, actual noise levels at receptors are also affected by active and reactive noise management measures employed to limit the risk of noise criteria exceedances. As mining progresses to the west closer to these receptors, additional noise management measures will limit the increase in noise levels that might otherwise occur. The effect of ongoing noise management measures will be greater than and will mask any minor noise level increase due to the proposed TOEA.

Later operations to redistribute and shape TOEA material into the final OEA will be indistinguishable from similar operations in recent and near-future years. Noise from such operations will also be substantially masked by other mining activity including overburden and coal extraction closer to receptors west and south-west of Bengalla. Alternatively, if TOEA material is rehandled into the final void in the absence of any other amendments to the current OEA, such operations will necessarily occur in the last stage of mining as coal is removed from the final void. This time period will naturally result in a reduced mining fleet given the limited overburden extraction, resulting in lower noise levels than the prior year with or without TOEA material rehandling.

Active and reactive management measures were not required to control noise to these receptors in the earlier years of mining, however will increasingly be required in future years as mining progresses to the west. The effect of such measures will mask any minor noise level changes due to the TOEA and will result in no additional risk of noise criteria exceedances if the TOEA is approved.

3.6 Other Acoustic Issues

The proposed TOEA will not require a distinct period of construction that differs from existing mining activities or any additional construction equipment, therefore no construction noise impacts will occur and a detailed construction noise assessment is not required.

The TOEA will similarly not require additional mining equipment and will therefore not affect staff numbers. No additional traffic movements to and from Bengalla will occur as a result of the TOEA and a traffic noise assessment is not required.

The TOEA will not change mining equipment or methods including blast locations, number of blast events or blast parameters. An updated blasting assessment is therefore not required.

4. CONCLUSION

An assessment of environmental noise from the proposed Bengalla TOEA to nearest receptors has indicated no appreciable changes are likely to occur at any receptor compared to recent measured and future predicted noise levels.

This conclusion would apply in the absence of the active and reactive noise mitigation and management measures that have been employed at Bengalla since mining commenced, however continued application of such measures will further reduce the risk of noise criteria exceedances resulting from the proposed TOEA. No additional or alternative noise management measures are likely to be required, particularly considering the minor effect of the TOEA on unmitigated noise levels from Bengalla to receptors.

The TOEA will not require any construction work and will have no effect on other acoustic issues such as road traffic noise or blasting.

We trust this assessment provides sufficient information regarding acoustic issues associated with the Modification. Please contact the undersigned for any further information or discussion.

BRIDGES ACOUSTICS

MARK BRIDGES BE (Mech) (Hons) MAAS
Principal Consultant

APPENDIX C

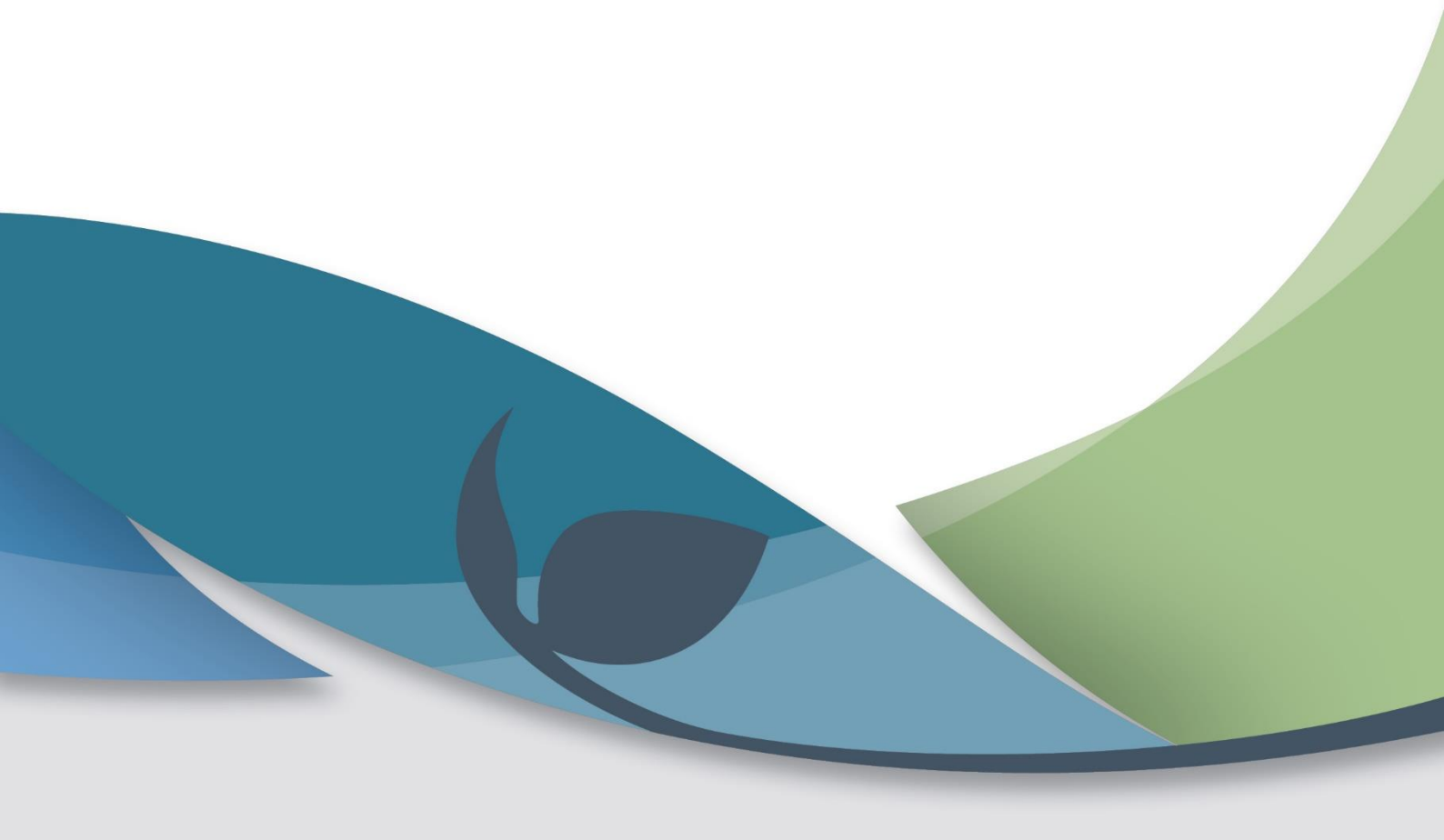
VISUAL IMPACT ASSESSMENT

JAMES BAILEY & ASSOCIATES
Environmental and Planning Consultants

SSD-5170 MOD 7 VISUAL IMPACT ASSESSMENT

for Bengalla Mining Company Pty Limited

19 February 2025



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1. INTRODUCTION

This section introduces the proposed Temporary Overburden Emplacement Area and describes the purpose and structure of this report.

1.1 OVERVIEW

James Bailey & Associates (JBA) has been engaged by Bengalla Mining Company Pty Limited (BMC) to undertake a Visual Impact Assessment (VIA) of the proposed Temporary Overburden Emplacement Area (TOEA) (the Modification). This VIA will support an application for a modification to State Significant Development (SSD) 5170 under Section 4.55 of the *Environmental Planning & Assessment Act 1979*.

1.2 BACKGROUND

BMC operates the Bengalla Mine (Bengalla) in the Upper Hunter Valley of NSW. Bengalla is located approximately 130 kilometres (km) north-west of Newcastle and 4 km west of Muswellbrook (see **Figure 1**).

Bengalla is managed in accordance with SSD-5170 granted under the then Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). SSD-5170 (as modified) enables the continuation of open cut coal mining and associated activities at Bengalla until 28 February 2039.

A VIA for Bengalla was undertaken as part of the '*Continuation of Bengalla Mine Environmental Impact Statement'* (Hansen Bailey, 2013) (Bengalla EIS) titled '*Continuation of Bengalla Mine Project Visual Impact Assessment*' (JVP Visual Planning and Design, 2013) (2013 EIS VIA). Five modifications to SSD-5170 have been approved to date of which the majority did not propose any material changes to the visual character of the Bengalla.

The '*Bengalla Development Consent Modification 2 Statement of Environmental Effects Visual Impact Assessment'* (VPA Visual Planning & Assessment, 2016) (2016 MOD2 VIA) was undertaken to support the '*Bengalla Mine Development Consent Modification Statement of Environmental Effects*' (Hansen Bailey, 2016a) (MOD2 SEE). The 2016 MOD2 VIA quantified the visual impacts associated with changes to the main Overburden Emplacement Area (OEA), which was designed to incorporate two Visual Relief Areas:

- The Northern Relief Area, constructed to a maximum height of Reduced Level 300; and
- The Southern Relief Area, constructed to a maximum height of Reduced Level 290.

The visual impacts associated with the expanded ROM stockpiles were also considered as part of the '*Bengalla Mine Development Consent Modification 4 Statement of Environmental Effects'* (Hansen Bailey, 2017) (MOD 4 SEE). It was concluded that the infrastructure changes would not result in material additional visual impacts beyond those previously approved for Bengalla.

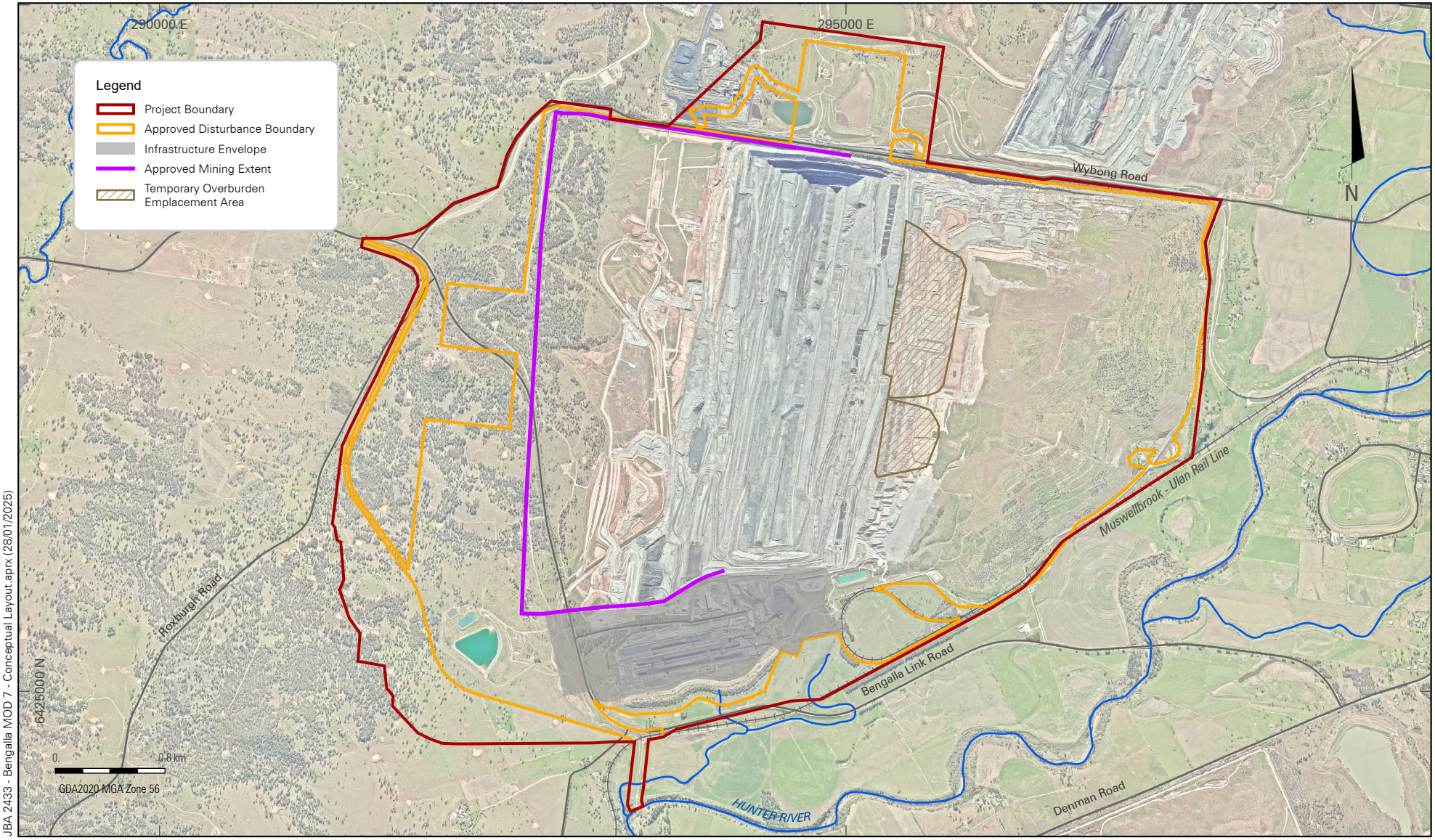
The '*Bengalla Mine Modification 5 Submission Report*' (James Bailey & Associates, 2022) confirmed the existing visual bund, topography, tree screens and viewing distance would screen any sensitive views to proposed infrastructure upgrades. A '*Visual Screening Constraints Review'* (James Bailey & Associates, 2022) was also completed to support flexibility in relation to the required visual tree screens and enable alternate measures to be implemented where reasonable and feasible that would enhance visual screening of Bengalla for road users.

JBA 2433 - Bengalla MOD 7 - Regional Locality (28/11/2024)

BENGALLA MINE

Regional Locality

FIGURE 1



JBA 2433 - Bengalla MOD 7 - Conceptual Layout.aprx (28/01/2025)

BENGALLA MINE MOD 7

Conceptual Modification Layout

FIGURE 2

1.3 MODIFICATION OVERVIEW

The Modification entails the development of the TOEA for the temporary storage of approximately 11 Million loose cubic metres (Mlcm) of waste overburden material within the existing OEA footprint. The Modification consists of an interim landform which will be approximately 25m higher than the approved final landform within this area, while remaining 20m lower than the maximum approved final landform height of RL300m. The conceptual TOEA design proposed for the Modification is illustrated in **Figure 2**.

1.4 DOCUMENT PURPOSE

The Bengalla EIS assessed the visual landscape of the area and determined the impacts of Bengalla on the character of the landscape within and adjacent to the Project Boundary. This VIA provides an assessment of the visual impacts to the contemporary landscape values as a result of the Modification beyond those approved for Bengalla (as modified).

This VIA:

- Provides an overview of the existing visual settings created by various landscapes in and around Bengalla;
- Assesses the visual character and visual effect created by the Modification;
- Considers the visibility of the components of the Modification from relevant sensitive receivers;
- Includes an assessment of the likely visual impacts of the Modification giving regard to visual effect and sensitivity;
- Outlines recommendations regarding any management or mitigation strategies to ameliorate any identified additional visual impacts of the Modification; and
- Considers cumulative visual impacts in the locality and includes a consideration of night lighting effects.

1.5 METHODOLOGY

The methodology to determine the level of visual impact of the Modification involves four stages as follows:

1. Detailed review of the existing environment including the natural environment, land ownership and landuse. This stage also considered any changes to the primary visual catchment (PVC) and visual character units (VCUs) previously identified within the landscape vista;
2. An assessment of the visual elements of the Modification to determine:
    a. Visual sensitivity - a measure of how critically a change to the existing landscape is viewed by people from different landuse areas in the vicinity of the Modification;
    b. Visual effect - visual properties (contrast and integration with the landscape) of the Modification against the approved operations, with consideration of the proportion of the view occupied by the changes proposed;
3. An overall assessment of the impact on the visual landscape by considering both visual effect and visual sensitivity; and
4. Determination of any required management measures to mitigate visual effects, sensitivity and visual impacts.

1.6 DOCUMENT STRUCTURE

The document is structured as follows:

- **Section 2** provides a discussion on the topography, natural features, landuse and land ownership and describes changes to the landscape that have taken place since the preparation of the Bengalla EIS;
- **Section 3** considers each view sector surrounding Bengalla and describes the existing visual environment. The sensitivity of viewing locations has been determined based on the landuse and visibility of Modification elements;
- **Section 4** describes the Modification and assesses the visual effect of the relevant elements on the existing visual landscape;
- **Section 5** describes the visual impact of the Modification at representative locations in the contemporary environment surrounding Bengalla; and
- **Section 6** describes the relevant mitigation measures.

2. EXISTING ENVIRONMENT

This section provides a discussion on the topography, natural features, landuse and land ownership of the existing environment for Bengalla. It also describes changes that have taken place since the preparation of the 2013 EIS VIA, 2016 MOD 2 VIA and MOD 4 SEE.

2.1 NATURAL ENVIRONMENT

Bengalla is located in the Upper Hunter Valley of NSW, approximately 130 kilometres (km) north-west of Newcastle and 4 km west of Muswellbrook. The land within the SSD-5170 Project Boundary not occupied by mining activity is generally undulating and slopes downwards towards the Hunter River to the south.

The edges of the Hunter Valley are defined by steep, heavily vegetated mountain ranges to the east and west, with significant elevation above the valley and foothills. While these ranges are located at a significant distance from Bengalla, they create a background to valley views over existing mining operations.

Much of Bengalla's immediate locality consists of industry, farmland and remnant vegetation. The area within the Project Boundary has been previously subject to land clearing and is comprised of a patchwork of remnant native vegetation and grassland areas. Fauna habitat largely includes Derived Native Grasslands and to a lesser extent, regenerating woodland and open forest that have been partially thinned or cleared in the past.

The key natural feature in the vicinity of Bengalla is the Hunter River, which has a catchment of approximately 4,300 km^2 to Muswellbrook. The Hunter River alluvial flats are situated within the eastern and southern extents of the Project Boundary. The main channel of the Hunter River meanders to the south of Bengalla and a small portion of its floodplain is located within the Project Boundary.

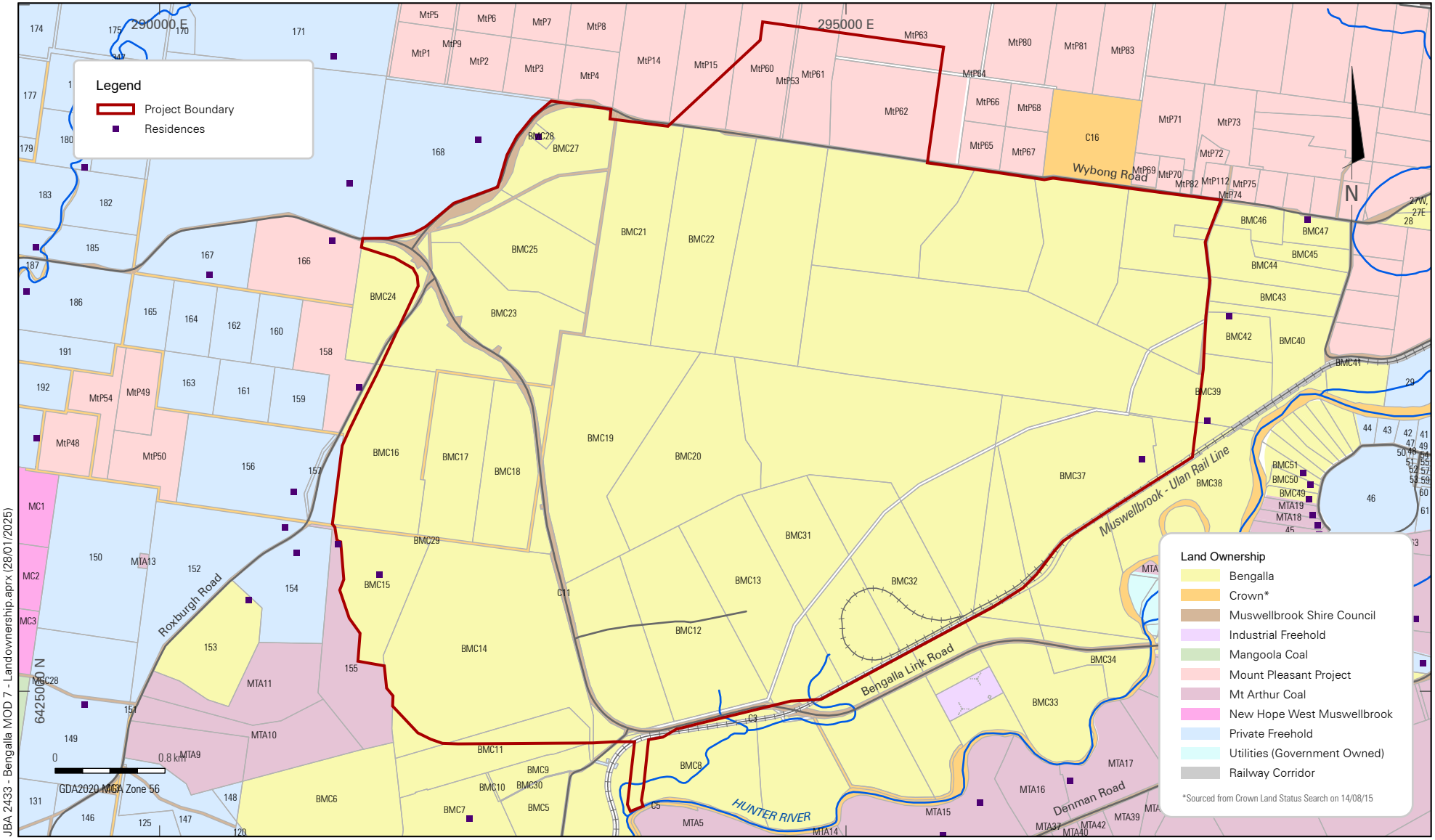
Dry Creek is a 3rd order stream that flowed in a southward direction through the centre of the Project Boundary. Dry Creek is an ephemeral tributary of the Hunter River and has a total catchment area of approximately 18 km^2. SSD-5170 authorises the temporary diversion of Dry Creek during mining operations. The temporary diversion has been completed and consists of a clean water dam (CW1) and pump and pipeline system to capture and circulate clean runoff around the mining area. Dry Creek will be re-instated within the rehabilitated landform during the later years of the mine progression.

2.2 LANDOWNERSHIP

The ownership of land within and surrounding the Project Boundary is shown in **Figure 3**.

Land surrounding Bengalla is dominated by mining leases held by various mining companies. Bengalla is adjoined to the north by the Mount Pleasant Mine (operated by MACH Energy Australia (MACH)) and the Mt Arthur Coal Mine (operated by Hunter Valley Energy Coal (HVEC)) to the south-east. Land further to the west of Bengalla in a separate visual catchment is held by Glencore for the Mangoola Coal Mine. BMC owns all the freehold land within the Project Boundary except for some parcels north of Wybong Road which are owned by MACH. BMC holds Mining Lease (ML) 1711 in respect of its infrastructure in this area.

Private lands are mainly located to the east and west. To the east, the visual catchment is dominated by Muswellbrook. To the west, the area is comprised of a number of small-scale rural holdings and rural residences as well as some rural/tourist destinations.



JBA 2433 - Bengalla MOD 7 - Landownership.aprx (28/01/2025)

BENGALLA MINE MOD 7

Landownership

FIGURE 3

2.3 LANDUSE

The major landuses in the vicinity of Bengalla are agriculture, coal mining and associated power generation industries. Each is briefly described below.

2.3.1 Agriculture

The Upper Hunter region has a long history of a variety of agricultural industries. The Hunter River and its alluvial floodplain support agricultural activities including small to medium scale cattle grazing operations, dairy farms, several wineries and vineyards, horse studs and other equine industries.

All land within the Project Boundary is mine owned land. Land owned by the Bengalla Joint Venture (BJV) or BMC that is outside the active operation area is managed by Bengalla Agricultural Company Pty Limited for cattle grazing and cropping. There are a small number of land holdings owned by BJV/BMC that are not within the active mining area that have been acquired as a result of landowners exercising their right to acquisition under SSD-5170.

2.3.2 Extractive Industries

The land surrounding Bengalla is largely dominated by mine owned land for various operations as described in **Section 2.2**.

Mining operations at Mount Pleasant Mine were considered within the 2013 EIS VIA however, since this time, MACH has obtained additional approvals for changes to mining operations and BHP has announced operations will be ceasing at Mt Arthur Coal Mine in 2030. Noticeably, the extent of mining and industrial areas indicate significant changes in the disturbance footprints of the Mount Pleasant Mine and Mt Arthur Coal Mine operations which have been undertaken since the 2013 EIS VIA and 2016 MOD2 VIA.

2.3.3 Town Centres

The township of Muswellbrook is located approximately 4km east of Bengalla. The Muswellbrook Industrial Estate is located on Thomas Mitchell Drive, approximately 4 km south of Bengalla. Muswellbrook Industrial Estate includes a variety of businesses that provide support services to the mining and power generation industries.

The commercial areas of the Muswellbrook town centre are located on lower slope areas that are generally not visually affected by Bengalla. There are some existing views of Bengalla from more elevated commercial areas. The most significant area in relation to potential visual impacts is the Racecourse Road Precinct that includes the Muswellbrook Racecourse and some private residences.

The smaller community of Denman is located 15 km to the south-west of Bengalla. Bengalla is not visible from the town centre.

2.3.4 Public Roads

The major road in the region is the New England Highway. Regional roads include Wybong Road, Bengalla Link Road and Denman Road, in addition to smaller local roads.

2.3.5 State Forest and Conservation Areas

There are no State Forests within 50 km and no substantial National Parks in close proximity to Bengalla. The closest National Parks to Bengalla are the Wollemi National Park, situated approximately 22 km to the south and Goulburn River National Park, situated approximately 30 km west.

2.3.6 Biodiversity Offsets

The Mt Arthur Coal Mine 'Constable' Offset Area is located to the west of the Project Boundary off Roxburgh Road and was established under MP 09_0062. The 'Constable' Offset Area, of approximately 110 ha, is subject to a Conservation Agreement under the *National Parks and Wildlife Act 1974*.

2.4 PRIMARY VISUAL CATCHMENT

The PVC represents the area within which the majority of critical views of Bengalla are obtained. The PVC for Bengalla was identified and described within the 2013 EIS VIA and 2016 MOD2 VIA. It includes the area from within which the majority of potential critical views of Bengalla would be able to be experienced, based on distance and a consideration of topography alone as a screening element. As illustrated in **Figure 4**, the PVC is encompassed by the ranges to the north and west, the townships of Muswellbrook and Aberdeen to the east and existing mining operations surrounding the site.

The Modification is located wholly within the existing SSD-5170 Disturbance Boundary (see **Figure 2**). Therefore, the PVC will not measurably change compared to that previously described in the 2013 EIS VIA and 2016 MOD2 VIA.

2.5 VISUAL CHARACTER UNITS

Within any landscape, there are areas of similar visual features which are defined as a Visual Character Units (VCUs). VCUs typically share similar topography, vegetation, hydrological features and landuse patterns that create areas of visual consistency. Individual VCUs are observed in combination with one another to create a landscape vista. Understanding how the Modification will interact with the surrounding landscape from potential receivers compared to the currently approved operations will assist in determining any potential impacts to the visual character of the landscape.

The current VCUs within the PVC include:

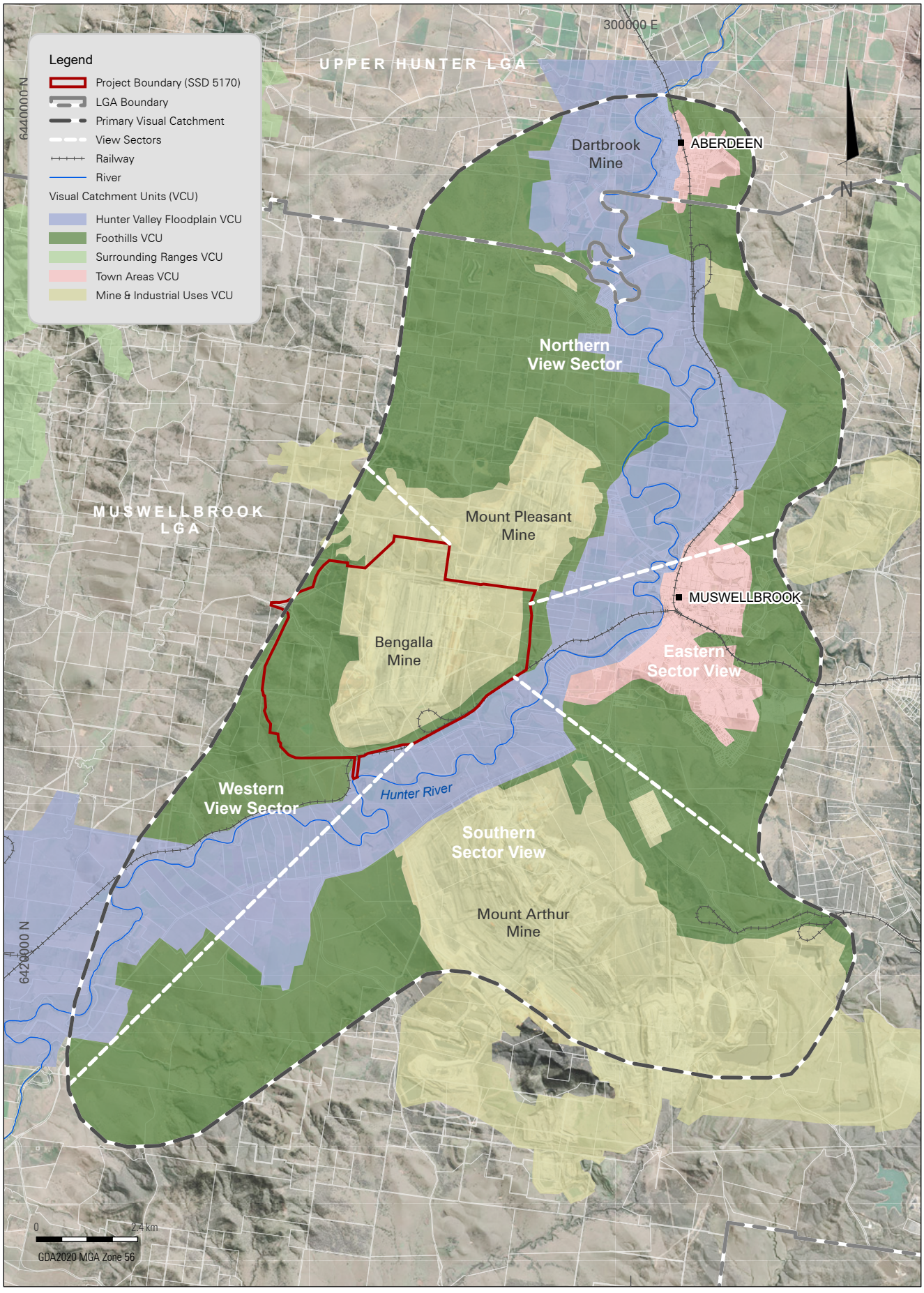
- Hunter River Floodplain;
- Foothills;
- Mine and Industrial Uses;
- Town Areas; and
- Surrounding Ranges.

These VCUs remain contemporary and are briefly described below and illustrated on **Figure 4**. The key change to the VCUs identified in the 2013 EIS VIA and 2016 MOD2 VIA is the increased extent of the Mine and Industrial Uses VCU in the vicinity of Bengalla. Noticeably, the PVC continues to include land occupied by Bengalla, Mt Arthur Coal Mine and Mount Pleasant Mine, however as shown in **Figure 4** there has been an increase in the disturbance footprints of these operations since the Bengalla EIS was completed.

2.5.1 Hunter River Floodplain

The Hunter River Floodplain divides the PVC from northeast to southwest. This VCU is characterised by alluvial river flats which support a range of agricultural activities including pasture, cropping, a vineyard and a thoroughbred horse stud. This creates vibrant rectangular and circular patterns contrasting with the surrounding VCUs.

The Hunter River itself meanders through the VCU with dense riparian vegetation along the riverbanks interrupting localised viewpoints towards Bengalla. The Hunter River Floodplain Unit includes portions of the New England Highway and various other local roads (including Denman Road and Bengalla Road to the south of Bengalla). The flat topography characteristic of the Hunter River Floodplain also supports the Muswellbrook – Ulan Rail Line and Main Northern Railway.



JBA 2433 - Bengalla MOD 7 - Visual Character Units.aprx (4/12/2024)

BENGALLA MINE

Visual Character Units

FIGURE 4

2.5.2 Foothills

The foothills adjacent to the Hunter River Floodplain are generally gently sloping, rising to form the ridges of the surrounding ranges. These hills, for the greater part, have been cleared for grazing purposes and support grasslands with scattered trees and open forest woodlands on steeper areas and along some gully lines. The Foothills VCU is the typical rural landscape of the region.

To the north and west of the PVC, foothills are generally gently sloping rising to form the ridges of the surrounding ranges. To the east and south, foothills generally exist in isolation and in most instances are not connected directly to any particular surrounding range. The hills have comparatively lower elevations in the order of 250 m.

This VCU supports rural residences in the lower and more gently sloping areas adjacent to the Hunter River flood plain and along the Roxburgh Road ridgeline. Whilst not highly populated, there are both mine owned residences and limited private rural residences within the PVC, most of which have existing rights to acquisition as illustrated on **Figure 3**.

2.5.3 Mine and Industrial Uses

This PVC has a strong industrial visual character due to established coal mines and associated activities within the local area. This VCU consists of the existing Bengalla operation, as well as the larger Mt Arthur Coal Mine to the south, Mount Pleasant Mine to the north and the Thomas Mitchell Drive Industrial Estate. Beyond the PVC, there are also further extensive mining operations in the region. From various locations such as Aberdeen and the adjoining areas within the Southern Foothills, Mt Arthur Coal Mine operations are also seen in the context of Bengalla.

Bengalla includes the active open cut mining area and associated OEA with two profiles; the active western face and the eastern face with views towards Muswellbrook and Aberdeen. The eastern face has been progressively rehabilitated and incorporates two Visual Relief Areas to a maximum RL 300 which are designed to improve visual amenity from primary viewing locations in and surrounding the township of Muswellbrook and from Denman Road. The Bengalla Coal Handling and Preparation Plant (CHPP) and other infrastructure are visually evident only from a limited number of locations to the south and west and have been substantially screened through the installation of visual bunds and tree screens.

Mt Arthur Coal Mine is the dominant mining operation in the landscape and includes the Mt Arthur Coal Open Cut, the Mt Arthur Coal Underground Project (no underground operations are currently taking place), Mt Arthur Coal CHPP, rail loop and rail load out.

The Mount Pleasant Mine includes active mining areas and an associated OEA which is visually prominent within the landscape in areas to the north, east and south. Infrastructure areas are evident from Wybong Road, which separates Mount Pleasant Mine and Bengalla and has existing views of both active operations mitigated by various screening measures.

The Thomas Mitchell Drive Industrial Estate is an industrial area that also occurs in the Southern Foothills.

2.5.4 Town Areas

The Town Areas VCU is characterised by various common visual elements of residences, streetscapes, commercial areas, and recreation areas. The township of Muswellbrook is located on Hunter River Floodplain and foothills to the east of Bengalla. The Racecourse Road Precinct contains the Muswellbrook Racecourse and some residences in close proximity to Bengalla. The township of Aberdeen is located approximately 12 km to the north-east of Bengalla. Some parts of the town are on elevated slopes with easterly and south-easterly aspects. The significance of the Town Areas VCU is the concentration of sensitive receivers in the form of residential development areas (see **Figure 4**).

While both Town Areas would have some views of Bengalla, these are primarily of the eastern face which has been progressively rehabilitated as described in **Section 2.5.3**. These towns also have existing views of neighbouring mining operations.

2.5.5 Surrounding Ranges

The Surrounding Ranges VCU define the edges of the Hunter Valley and occur on both the eastern and western sides of the valley. These mountain ranges have significant elevation above the valley floor and foothills, are steep and forest covered, however are located at significant distances from Bengalla.

The visual significance of the Surrounding Ranges is that they often create the background to valley views from a large range of view locations. Areas that experience views to these distant ranges over existing mine developments include elevated areas in the foothills, and those residential areas on the western edge of Muswellbrook.

3. VISUAL SENSITIVITY

This section assesses the potential change to the existing landscape when viewed by different landuse areas and other receivers from varying distances. The sensitivity of the viewing locations has been determined based on the landuse that utilises the viewing location and the visibility of the Modification elements.

3.1 OVERVIEW

The Modification was assessed from various viewing locations. Visibility to the Modification depends on factors such as distance, topography and vegetation, existing and approved development components of Bengalla (specifically the OEA) and mitigation measures (existing visual bunds, screens and rehabilitated areas).

The sensitivity of these viewing locations will depend on the landuse of that location. Landuses that utilise the view (i.e. residences and recreation areas) will have a high sensitivity, whereas areas such as rural lots (without a residence) have a low sensitivity, as they do not gain value by utilising the view.

As described in **Section 2.4** and illustrated on **Figure 4**, the PVC includes the area within which the majority of critical views of Bengalla are obtained. The PVC and can be divided into the following sectors:

- The Northern View Sector, that includes the town of Aberdeen;
- The Eastern View Sector, that includes the town of Muswellbrook and adjoining foothills;
- The Southern View Sector, that includes the foothills south of the Hunter River Floodplain; and
- The Western View Sector, that includes the ridge line of the foothills in the vicinity of Roxburgh Road.

The potential viewing locations surrounding the approved Bengalla Project Boundary include:

- Town Areas such as Muswellbrook, Aberdeen, and from outside the PVC and to a lesser extent, Denman;
- Rural residences. These are usually more isolated properties scattered throughout the PVC, and sometimes within elevated locations take advantage of views across the Hunter River Floodplain;
- Recreation areas and Tourist Facilities, such as Muswellbrook Racecourse and Pukara Estate olive grove (Pukara);
- Roads, including the new England Highway which is the major road through the PVC. Regional roads within the PVC are Wybong Road, Bengalla Link Road and Denman Road, in addition to smaller local roads; and
- Historic homesteads of 'Bengalla', 'Edinglassie' and 'Rous Lench'.

3.2 NORTHERN VIEW SECTOR

The Hunter River Floodplain VCU supports a number of semi-rural lots with scattered rural residences along roadways. While the agricultural landuse areas have low sensitivity, residences would have high sensitivity to any potential views. There are also a limited number of residences located in the Foothills VCU. Those adjacent to Wybong Road are located on mine owned land.

The town of Aberdeen is located on the southern edge of the PVC over 10 km away from Bengalla. The views toward the Bengalla OEA and Visual Relief Areas will be unobstructed by topography or vegetation, however the sensitivity of these viewpoints is reduced due to the significant distance to and thus visibility of Bengalla.

The only major road in this sector is the New England Highway which travels south through Aberdeen, heading south toward Muswellbrook. As this road runs alongside or within the Hunter River Floodplain, the views of Bengalla in a southerly direction from the road are often unobstructed.

The extent of the Mine and Industrial Uses VCU within the Northern View Sector has substantially increased since the 2013 EIS VIA and 2016 MOD2 VIA due to the development of the Mount Pleasant Mine. The elevation of the integrated waste rock emplacement landform has increased the number of locations from which views of the Mount Pleasant Mine are available and further screened potential views of Bengalla.

The Modification will not alter the existing views of the Bengalla from the Northern View Sector. Views of Bengalla are limited due to the screening provided by the extent of adjacent Mine and Industrial Uses VCU and the existing Bengalla OEA (and its rehabilitated outer edges and slopes). The TOEA is located within the active face of the Bengalla OEA footprint and is lower than the height of the existing Bengalla OEA landform. As such, there will be no discernible difference to the visibility of Bengalla from the Northern View Sector associated with the Modification.

3.3 EASTERN VIEW SECTOR

The Eastern View Sector contains the highest number of potentially sensitive receivers. This sensitivity relates to the residential nature of Muswellbrook and the tourist/main road function of the New England Highway and parts of the commercial centre. Visibility to the existing approved mining operations at Bengalla is high due to the western orientation and position of the Bengalla OEA. The landform and profile of the approved OEA is consistent with adjacent topographic features. Dense woodland rehabilitation required in accordance with SSD-5170 is well established on the eastern face of the Bengalla OEA, including the Northern and Southern Relief Areas. This creates a moderate level of visual integration with the surrounding landscape textures and vegetation patterning.

On the basis of landuse, residences in Muswellbrook have previously been assessed as having moderate to high sensitivity depending on viewing distance. Due to the density of town development, views from the majority of residences are screened by adjacent housing, associated structures, and garden and streetscape vegetation. The residences in the vicinity of Racecourse Road are the closest to Bengalla in the Town Areas VCU, however the more distant residences at the new Ironbark Ridge Estate have a more critical angle of view due to the elevated location. Views of Bengalla are restricted to the east and south-east faces of the existing OEA which has been progressively rehabilitated to the approved maximum RL of 300 m.

Topographic cross sections have been developed to assess the Modification visibility from the Eastern View Sector at two key viewing locations, consistent with the 2013 EIS VIA and 2016 MOD2 VIA. Cross section locations are identified on **Figure 5** and include:

- Elevated viewpoint from the New England Highway (PM7) (**Figure 6**, Cross Section A); and
- Residential viewpoint from Ironbark Estate (PM3) across the Racecourse (**Figure 6**, Cross Section B).

As illustrated by the Cross Sections in **Figure 6**, the Modification will not be visible from the Eastern View Sector. The existing views of the Bengalla OEA and its rehabilitated outer edges and slopes will shield any potential views of the Modification. As such, there will be no additional visual impacts associated with the Modification from the Eastern View Sector.

3.4 SOUTHERN VIEW SECTOR

The Southern View Sector is dominated by mining and agricultural landuses and as such, views of existing Bengalla operations vary. The more easterly viewpoints are onto the rehabilitated Bengalla OEA, consistent with those experienced by receivers in the Eastern View Sector. This includes viewing locations along Denman Road, Thomas Mitchell Drive and Edderton Road. As such there are no views to the Modification from this area. In the western portion of the sector, the initial view is onto the active face of the Bengalla OEA, which will reduce over time as rehabilitation is progressively undertaken.

The most sensitive viewing locations in the sector include a limited number of residences within the southern Foothills VCU and residences along Denman Road within the Hunter River Floodplain VCU. As the landform of the Hunter River Floodplain VCU is relatively flat and open, it allows long views towards Bengalla. Properties oriented north-east also have direct views which can only be moderated by screening elements at the point of

viewing. Sensitivity levels would therefore be moderate to high for properties less than 7.5 km away from the active face of the Bengalla OEA.

The historic homesteads of 'Edinglassie' and 'Rous Lench' are located on Denman Road in the central portion of the Southern View Sector. These homesteads would have previously had some views to the Bengalla OEA but not from primary view zones around the main homesteads. The main view zone of 'Edinglassie' is to the south and for 'Rous Lench' is to the east. Due to the progressive rehabilitation undertaken on the southern face of the Bengalla OEA, vegetation is well established which shields potential views of the active overburden emplacement. This creates a moderate level of visual integration with the surrounding landscape textures and vegetation patterning. These homesteads would have high sensitivity, but screening removes potential viewpoints.

The Southern View Sector also includes Pukara which is owned by HVEC (the operator of Mt Arthur Coal). Pukara was established in 1999 and in addition to the olive oil products produced, Pukara supports several tourist-based elements. Tourist activities are mostly confined to tasting rooms, associated selling centres and adjoining outside patio areas, however these are visually contained and screened by the grove.

Previous VIA's have determined the western portion of Denman Road has a moderate sensitivity up to 7.5 km, after which sensitivity would reduce to low.

A topographic cross section has been developed to assess the Modification visibility from Denman Road adjacent to Pukara (PM5) consistent with the 2013 EIS VIA and 2016 MOD2 VIA assessment locations. The cross-section location is identified on **Figure 5.** As illustrated by **Figure 7** Cross Section C, the Modification will be visible from this area within the existing active face of the OEA. As the Modification is within the existing footprint of the OEA and in consideration of the broader landscape context, the difference will be a minor percentage of overall viewshed.

3.5 WESTERN VIEW SECTOR

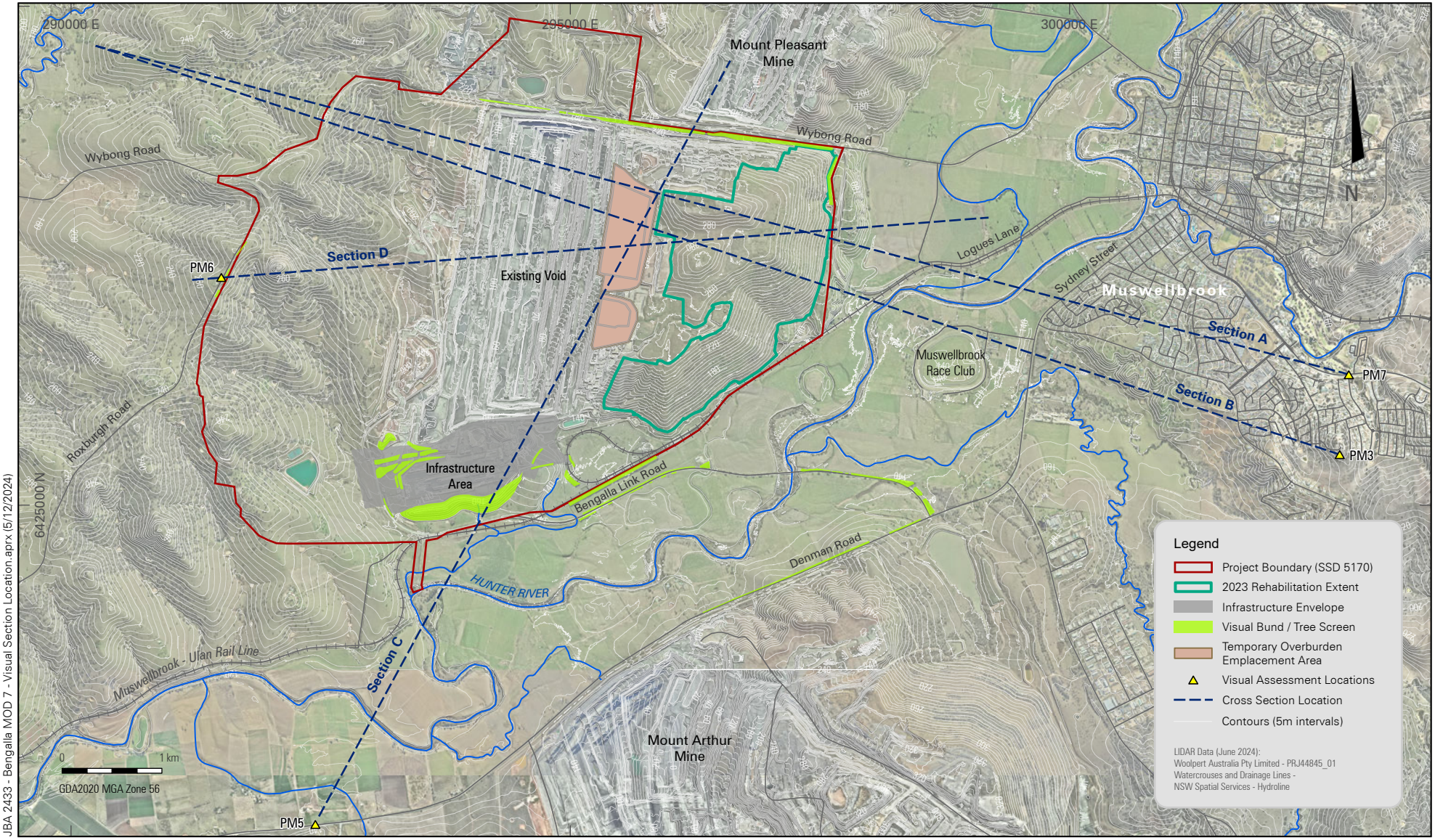
The potential view locations within the Western View Sector are associated with Roxburgh Road and parts of Wybong and Denman Roads and the rural residences along them. Views are interrupted by vegetation and topographic features typical of the Foothills VCU.

Where feasible, BMC has undertaken tube stock planting adjacent to Roxburgh Road on land owned by the BJV. Tree screens have been designed in sections where there are potential views of Bengalla. Views from Bengalla Link Road are dominated by rural lands including improved pasture cropping and grazing along the river flood plains. Visual impacts are reduced as a result of the natural topography and vegetation, well established tree screens and visual bunds constructed around the Bengalla Infrastructure Envelope. The existing visual bunds and tree screens were determined to be effective in screening Bengalla from Bengalla Link Road users and viewpoints.

Views from Roxburgh Road to the Modification are generally limited by topographic features. Potential views are confined to the more elevated parts of the road for approximately the first 1 km from the intersection between Roxburgh Road and Wybong Road, as well as from elevated parts of Wybong Road itself before the intersection. Due to the significant distance to the Modification, these viewpoints have a low to moderate sensitivity. Most rural residences along Roxburgh Road are screened from the Modification by topography and vegetation.

A topographic cross section has been developed to assess the Modification visibility from Roxburgh Road adjacent to mine owned residence Receiver 158 (PM6), consistent with the 2013 EIS VIA and 2016 MOD2 VIA assessment locations. The cross-section location is identified on **Figure 5.** As illustrated by **Figure 7** Cross Section D, the Modification will be visible from this area within the existing active face of the OEA.

The Modification will not increase the existing maximum height of the OEA and in the broader landscape context, the difference will be a minor percentage of overall viewshed. The TOEA will be visually contiguous with the currently approved OEA. Sensitivity to the Modification from residences has been generally assessed to be low due to existing views of approved mining operations, viewing distance, intervening topography and a reduced visibility.



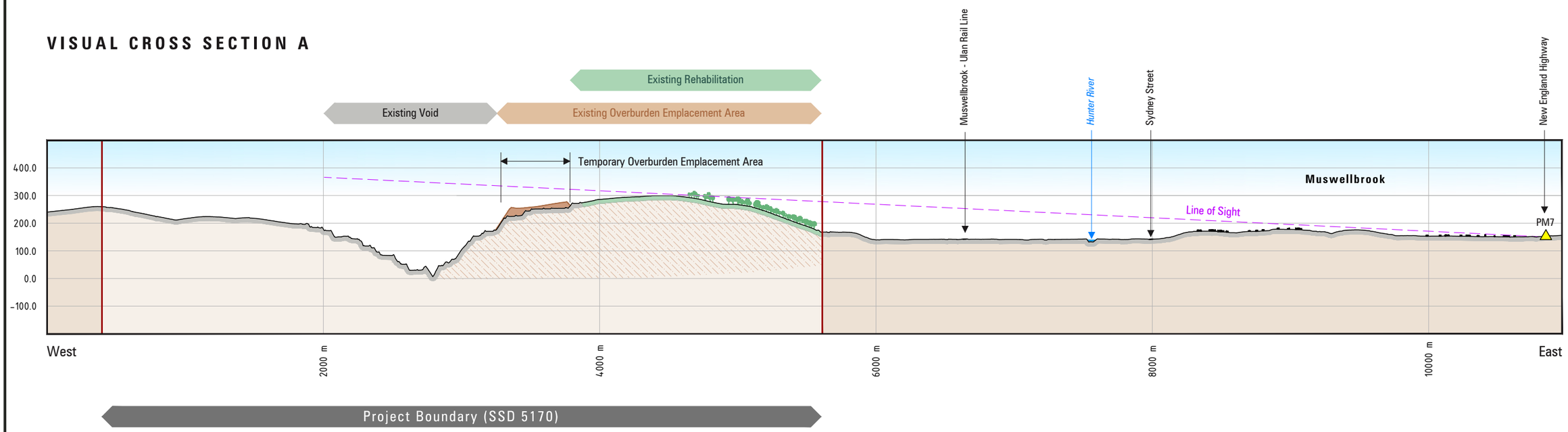
JBA 2433 - Bengalla MOD 7 - Visual Section Location.aprx (5/12/2024)

BENGALLA MINE MOD 7

Visual Setting

FIGURE 5

VISUAL CROSS SECTION A



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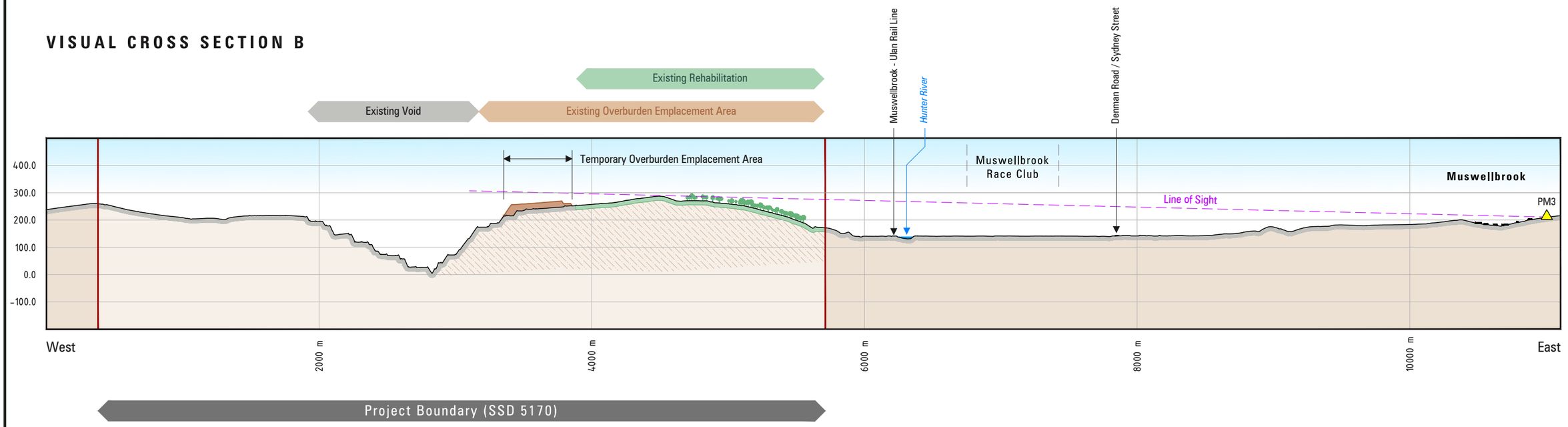


0 600 Horizontal Scale

0 300 Vertical Scale

Horizontal / Vertical Scale = 1/2

xenith

BENGALLA MINE MOD 7

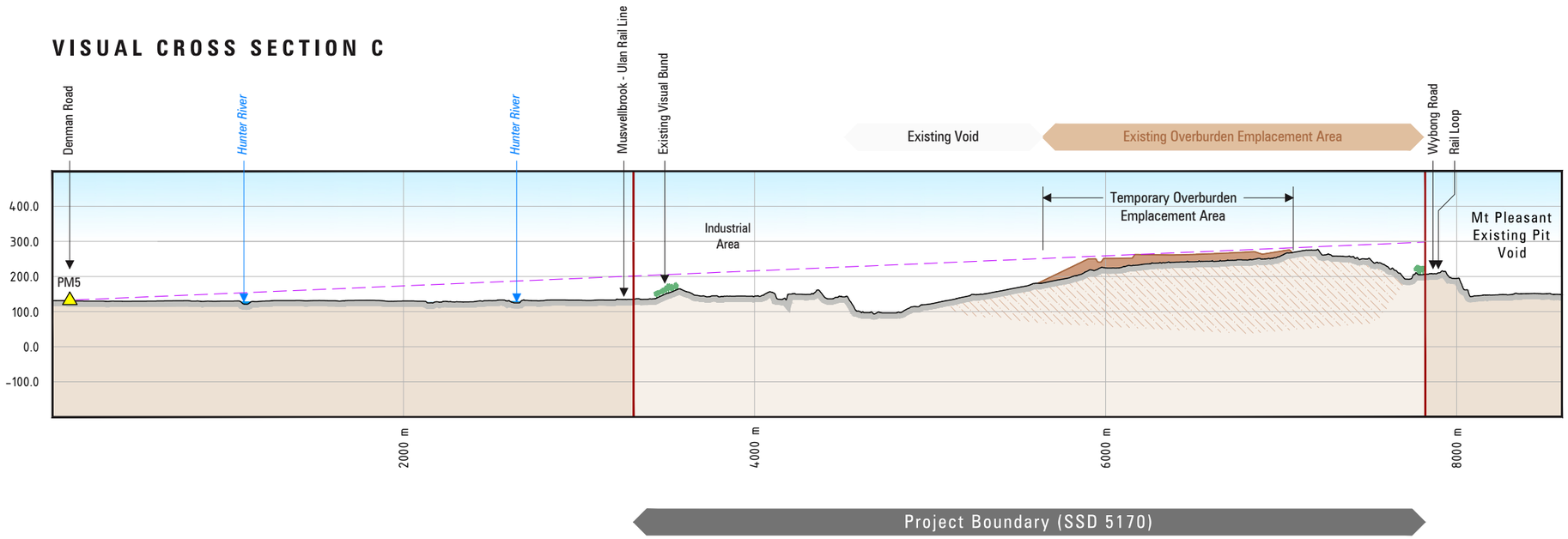
Visual Cross Sections A and B

Filename : JBA 2433 - Bengalla MOD 7 - Visual Cross Sections

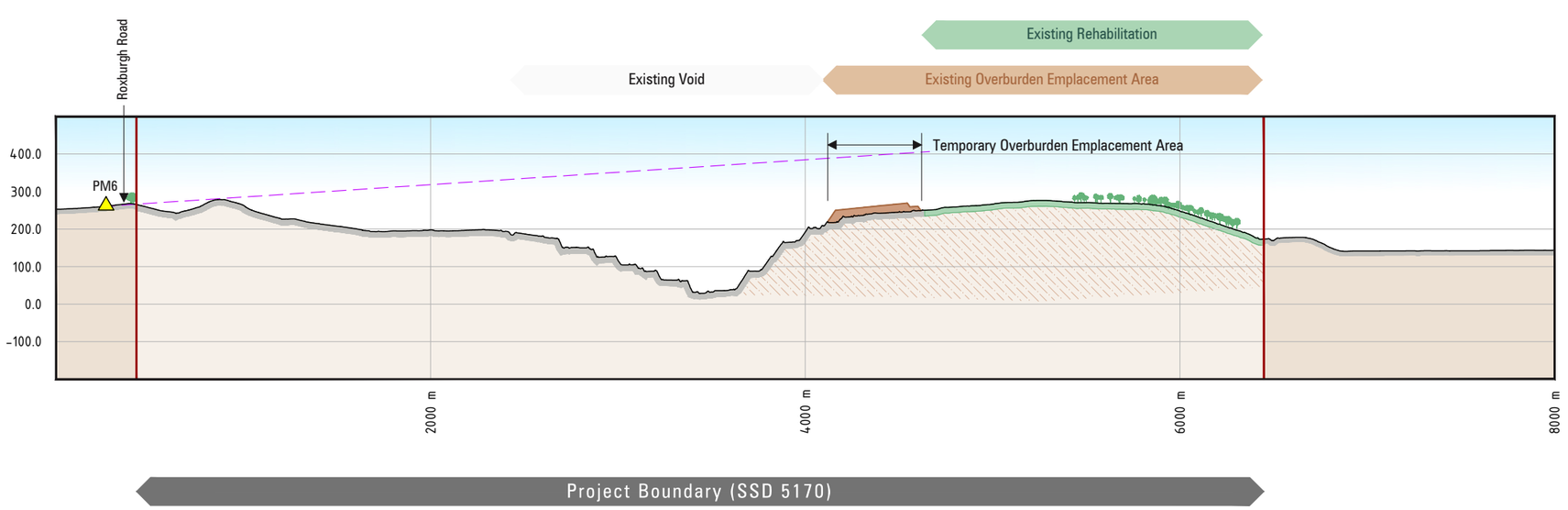
Figure 6

Date : 5-Dec-24 | Projection: GDA2020 | Drawn : PC | Revision : A

VISUAL CROSS SECTION C



VISUAL CROSS SECTION D



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Horizontal / Vertical Scale = 1/2

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BENGALLA MINE MOD 7

Visual Cross Sections C and D

Filename : JBA 2433 - Bengalla MOD 7 - Visual Cross Sections

Figure 7

Date : 5-Dec-24 | Projection: GDA2020 | Drawn : PC | Revision : A

3.6 CHANGES TO VISIBILITY/SENSITIVITY CREATED BY THE MODIFICATION

The visibility and sensitivity to the Modification varies within the view sectors. The detailed cross sections identified on **Figure 5** and illustrated on **Figure 6** and **Figure 7** demonstrate that the Modification will not be visible from the Northern and Eastern View Sectors.

The Southern View Sector is dominated by Denman Road. Some residences along Denman Road will continue to have views to the southern edges of the Bengalla extraction area and OEA. They will also have views onto the Modification, creating moderate to high sensitivity for residences and moderate sensitivity for Denman Road.

There are limited sensitive receivers within the most exposed Western View Sector. Roads within the sector have varying sensitivity based on distance and usage type. Significantly, views of the Modification for the Western View Sector will be indistinguishable from the current views due to its location within the active face of the Bengalla OEA.

4. VISUAL EFFECT

This section describes the proposed Modification and assesses the changes to the approved mining operations at Bengalla. It describes the visual effect of the Modification on the existing visual landscape.

The visual effects of Bengalla have already been identified in previous studies including the 2013 EIS VIA, 2016 MOD2 VIA and MOD 4 SEE. The degree to which the Modification contrasts with the existing visual landscape will determine the type of visual effect. The visual effect is assessed as a combination of the visual properties of the Modification against approved Bengalla operations, with consideration of the proportion of the view occupied by the changes proposed. For any type of visual properties, the lower the proportion of the view that is occupied by the development, the lower the level of visual effect.

There are no potential viewings of the Modification from locations from the Northern and Eastern View Sectors and as such no further assessment has been undertaken of those view sectors. The visual effects of the Modification were therefore considered from potential viewing locations in the Southern and Western View Sectors.

4.1 APPROVED OEA

The approved OEA at Bengalla as provided by SSD-5170 is one of the key mine components visible from surrounding viewing locations. The OEA has two primary faces:

- The active face and the western face are unshaped, steep, angular, and contain raw overburden material creating a high visual contrast and low integration with the natural environment, due to colour, form and scale;
- The eastern face of the OEA is predominantly rehabilitated with established areas of tree plantings which have reduced levels of visual contrast and improved levels of visual integration with surrounding landscape patterns and colours; and
- The northern and southern outer edges continue to be actively formed and progressively rehabilitated, further reducing visual contrast and improving visual integration.

4.2 MODIFICATION ELEMENTS

The Modification summarised in **Section 1.3** involves the placement of overburden material within the existing OEA footprint. To determine the visual effect, it is relevant to note there are no proposed changes to the following key visual elements of approved operation at Bengalla:

- SSD-5170 Disturbance Boundary;
- Surface infrastructure, including infrastructure envelope and water management system;
- OEA footprint;
- Landuse; and
- Final landform.

The proposed changes are considered minor in the context of mine features within the broader Mine and Industrial Uses VCU and more specifically within the context of the approved Bengalla OEA.

The conceptual TOEA design proposed for the Modification is illustrated in **Figure 2**. The TOEA Modification relates to an increase of 25m in the height of the OEA within this area, however this will remain 20m lower than the maximum height of RL 300 m approved under SSD-5170. This increase in height will be constructed by emplacement of overburden to the west of the visual relief areas within the active face of the OEA. This material will be rehandled into the final void to ensure that the currently approved final landform is achieved if future landform improvements are not realised.

4.3 VISUAL CHARACTER

A significant portion of the landscape in this locality is the existing active mine areas and OEAs. Any existing approvals for mining activity also need to be considered as part of the existing visual environment. This includes the existing approved Bengalla OEA and how it is proposed to develop over time. Due to the similar visual character of the TOEA and negligible contrast with the current OEA, the visual character of the Modification is consistent with the landscape in which it will be constructed.

4.3.1 Contrast and Integration

The level of contrast and integration of the Modification with its surrounding landscape determines visual effect. The TOEA elements are consistent in form, shape, pattern and colour with the approved Bengalla OEA. As such, there will be no visual contrast and the Modification will integrate with the approved OEA which is considered to be the immediate surrounding landscape. As such, the Modification will not increase the existing impacts to the surrounding landscape.

4.3.2 Proportion

A lower proportion of the view that is occupied by the Modification elements will result in a lower level of visual effect. This is determined by defining the proportion of the total field of view that is occupied by the Modification. The area occupied by the Modification represents a relatively small portion of the total view in consideration of the existing Bengalla OEA. As demonstrated by the cross sections in **Figure 6** and **Figure 7**, the Modification will not increase the existing maximum height of the OEA. The TOEA is located within the active face of the Bengalla OEA and in the broader visual context of the approved Bengalla elements, the difference will be a minor percentage of overall viewshed. The TOEA is considered to be visually contiguous with the currently approved Bengalla OEA.

4.4 VISUAL EFFECT

The visual effect of temporarily altering the height of the Bengalla OEA within a localised area is unlikely to result in a perceptible change in the line of view from viewing locations. The TOEA will be constructed within the active face of the OEA and as such, will be visible to existing viewing locations. As the vertical elevation is lower in the viewshed than the existing Bengalla OEA it is unlikely to become visible to more viewing locations previously outside the line of view.

The Southern View Sector is dominated by mining and agricultural landuses along the flood plain including improved pasture cropping, some grazing and an olive tree orchard. There are a limited number of private residences within the western portion of Denman Road with potential viewing locations onto the southern face of the Bengalla OEA. The TOEA profile will extend further to the West within the currently active face, however, will not be visually distinguishable from the existing Bengalla OEA. As rehabilitation of the southern face progresses the visual effect of the TOEA will be further decreased as views of the active face are screened from potential viewing locations.

The Western View Sector is also dominated by rural lands supporting lifestyle blocks in the elevated sections of Roxburgh Road. There will be limited visibility to the Modification from the west. The proportion of view occupied by the proposed TOEA is minimal and visible elements will integrate with the existing Bengalla OEA, resulting in a low visual effect.

The visual effects of the Modification are generally low for the limited viewing locations in the Western and South-western View Sectors. The proportion of the primary view occupied by the TOEA is minimal. The TOEA has been situated central to existing Bengalla operations in a location shielded by the two existing Visual Relief Areas. High visual integration has been achieved as the Bengalla OEA is the dominant feature in the existing landscape and the TOEA is relatively small in scale and considered to be visually consistent in form, shape, pattern and colour.

5. IMPACT ASSESSMENT

This section defines the visual impact and mitigation that is anticipated from various viewing locations around the Modification.

The visual impact will vary according to the visual effect of the Modification (**Section 3.6**), its visibility and the visual sensitivity of areas from which it is seen (**Section 3**). The potential sensitive viewing locations (receivers) around Bengalla, including towns, rural residences, roads and tourist locations have been defined above in terms of visibility, with the potential impacts discussed below.

As there are no potential viewing locations from the Northern and Eastern View Sectors, no further assessment has been undertaken of those sectors. The visual impacts were therefore considered from the potential viewing locations in the Southern and Western View Sectors.

The visual impacts associated with the Modification are generally low and remain consistent with the existing impacts from approved Bengalla operations due to:

- The relatively small scale of the TOEA relative to the existing Bengalla OEA and surrounding mining operations;
- Visual effects being consistent with the existing approved Bengalla landform; and
- The TOEA landform being screened from most sensitive viewing locations by the approved and rehabilitated Bengalla OEA and other topographic features.

5.1 RURAL RESIDENCES

Rural residences are located throughout the local setting within the PVC. The residences are located within the Foothills VCU and the Hunter River Floodplain VCU and take advantage of views in various directions.

The significant rural residences in this sector are south of the Modification, generally along the western portion of Denman Road. These residences in the vicinity of Pukara have existing open views onto the active face of the Bengalla OEA and the proposed TOEA location. The visual effect is consistent to that of the existing approved Bengalla OEA. The rehabilitated areas of the Bengalla OEA will dominate this view, progressively lessening visual effects of the Modification. A combination of restricted views and low visual effects would create low visual impacts to residences in the south-west in the Southern View Sector.

Levels of impact to residences in the Western View Sector will be unchanged by the Modification. The TOEA will not increase the height of the unrehabilitated face of the Bengalla OEA. The view is directly onto the active face of the TOEA however in terms of percentage of overall view zone, the increase in material does not change the visual effect. As such the visual impact on residences with views to the Modification in this sector will continue to be moderate to high.

5.2 ROADS

Bengalla is visible from Denman Road and a number of minor roads in the locality. These include Roxburgh Road, Wybong Road and Bengalla Link Road. Generally, visual impacts on these roads will be screened or low. Roxburgh Road and other local roads will continue to experience some views towards the Bengalla OEA which creates moderate to low visual impacts. More distant views will create low visual impact. The Modification will not increase the current visual impact on road users.

5.3 CUMULATIVE VISUAL IMPACT

To consider the cumulative impact of the Modification, it is necessary to consider its visual effect in the context of other mines seen within the one view from sensitive viewpoints.

The Modification will not add significantly to the cumulative visual impact created by open cut mining in the locality. The visual effects created by the active TOEA will be consistent in visual form to the Bengalla OEA, which will remain visually dominant.

Any visual effect due to the active emplacement of overburden will be the same or of a similar character to that currently experienced within the VCU. In terms of the cumulative visual impact, the Modification will be viewed within a landscape dominated by existing mining operations. The area occupied by the TOEA represents an insignificant portion of the total view in consideration of the overall existing landscape.

5.4 LIGHTING IMPACTS

Lighting impacts are influenced by the relative height and locality of operations and the presence of any off-site barriers such as topographic features and / or vegetation. Potential impacts include:

- Direct line of sight between a viewing location and a light source located on the TOEA; and
- General night-glow (diffuse light) that results from light of sufficient strength being reflected into the atmosphere.

The impacts associated with night lighting for the TOEA will remain similar to that experienced as part of the current approved operation. The Modification operational areas and associated night lighting will not be directly visible to most locations due to the screening effect of the OEA and adjoining topography, vegetation and visual screening. The only locations that will have direct line of sight to Modification night lighting are elevated locations such as Roxburgh Road. This is consistent with existing approved conditions at Bengalla from these locations. The Modification is unlikely to increase the diffuse lighting impacts which under specific atmospheric conditions may at times create a glow around Bengalla.

6. MITIGATION

This section describes proposed mitigation measures resulting from the Modification impacts.

As the Modification will not result in any additional material impact on the surrounding visual landscape at any viewing location, no additional mitigation or management measures are required beyond that outlined in the Bengalla EIS and SSD-5170.

BMC has implemented a range of existing management measures to mitigate the visual impacts of Bengalla. BMC will continue to implement all rehabilitation activities in accordance with the Bengalla Rehabilitation Management Plan and Strategy. Relevant to this Modification, the following on-site rehabilitation and visual screening treatments will continue to be maintained:

- The implementation of dense woody vegetation across the eastern face of the Bengalla OEA;
- Early, progressive establishment and rehabilitation of the outer faces of the Bengalla OEA, particularly the southern slopes adjacent to the Main Northern Rail Line;
- Temporary stabilisation and seeding of areas that cannot be progressively rehabilitated where reasonable and feasible; and
- Maintenance of existing tree planting and feasible visual screening measures along roads.

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ABBREVIATIONS

Abbreviation	Meaning
Bengalla EIS	*Continuation of Bengalla Mine Environmental Impact Statement'* (Hansen Bailey, 2013)
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
DA	Development Application
DPE	Department of Planning & Environment
DRG	Department of Planning, Industry and Environment – Division of Resources and Geoscience (now Mining Exploration and Geosciences (MEG) under Department of Regional NSW)
EESD	Environment Energy & Science Division of Department of Planning & Environment
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning & Assessment Act 1979*
EP&A Regulation	*Environmental Planning & Assessment Regulations 2021* (repealed EP&A Regulation 2000 on 1 Mach 2022)
EPBC Act	Commonwealth *Environment Protection & Biodiversity Conservation Act 1999*
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
GHG	Greenhouse Gas
GIS	Geographic Information System
GPS	Geographical Positioning System
ha	Hectare
LEP	Local Environmental Plan
LGA	Local Government Area
m	metres
MBBCh	Million bank cubic metres
Mining Act	*Mining Act 1992*
Mining SEPP	*State Environmental Planning Policy (Resources and Energy) 2021*
Mlcm	Million loose cubic metres
MOD2 SEE	'*Bengalla Mine Development Consent Modification Statement of Environmental Effects*' (Hansen Bailey, 2016a)
MOD4 SEE	'*Bengalla Mine Development Consent Modification 4 Statement of Environmental Effects*'(Hansen Bailey, 2017)
Mtpa	Million tonnes per annum
OEA	Overburden Emplacement Area
PVC	Primary Visual Catchment
RL	Reduced Level
RMS	Roads and Maritime Services

Abbreviation	Meaning
TOEA	Temporary Overburden Emplacement Area (the Modification)
SEE	Statement of Environmental Effects, now called a Modification Report for State Significant Development Modification Applications.
SEPPs	State Environmental Planning Policies
SSD	State Significant Development
VCU	Visual Character Unit
VIA	Visual Impact Assessment
2013 EIS VIA	*'Continuation of Bengalla Mine Project Visual Impact Assessment'* (JVP Visual Planning and Design, 2013)
2016 MOD2 VIA	'*Bengalla Development Consent Modification 2 Statement of Environmental Effects Visual Impact Assessment'* (VPA Visual Planning & Assessment, 2016)