JAMES BAILEY & ASSOCIATES
Environmental and Planning Consultants

GLENDELL MINE MODIFICATION 5

MODIFICATION REPORT

for Mt Owen Pty Ltd

20 December 2023

DOCUMENT CONTROL

Document Status

Version	Description	Reviewed By	Approved By	Date Issued
01	Glendell MOD5 Modification Report FOR REGULATORY REVIEW	A Wu	J Bailey	20/12/23

Document Details

Project Name	Glendell Mine Modification 5
Document Title	Modification Report
Client	Mt Owen Pty Ltd
Client Address	PO Box 320, Singleton NSW 2330
Author	James Bailey & Associates Pty Ltd
Author Address	6/127-129 John Street, Singleton NSW 2330
Our Reference	*231220 Glendell MOD5 Modification Report*

EXECUTIVE SUMMARY

THE APPROVED DEVELOPMENT

Glendell Mine is a coal mining operation located approximately 20 km north-west of Singleton in the Upper Hunter region. Glendell Mine is a component of the Mount Owen Complex, which also includes the Mount Owen and Ravensworth East Mines. The Mount Owen Complex is managed by Mt Owen Pty Limited, which is a subsidiary of Glencore Coal Pty Limited.

Glendell Mine operates under Development Consent DA 80/952 granted under the *Environmental Planning and Assessment Act 1979*. The approved development under DA 80/952 including the following activities:

- Extraction of up to 4.5 million tonnes per annum (Mtpa) of run of mine (ROM) coal using truck and excavator mining methods;
- Hauling of ROM coal to Mount Owen Mine for processing and transportation;
- Hauling of overburden and materials to and from Ravensworth East Mine;
- Transportation of up to 1 Mtpa of product coal to domestic power stations by conveyor;
- Ancillary surface infrastructure including offices, workshop, access roads, services and water management infrastructure; and
- Diversion of Bettys Creek and Swamp Creek.

DA 80/952 has been modified on four occasions. The most recent modification (MOD4) facilitated a minor expansion of the mining area to recover an additional 2.5 million tonnes of ROM coal.

DA 80/952 (as modified) allows for mining operations to be carried out until the end of June 2024.

THE MODIFICATION

The proponent seeks to extend mining operations under DA 80/952 by an additional two years (i.e. until the end of June 2026).

There is estimated to be 1.8 Mt of ROM coal remaining within the mining area approved through MOD4, which will not be able to be recovered within the approved period of mining. The proposed extension is required to recover the remaining coal, which will generate significant economic benefits to the local and state economies.

The Modification will not alter any aspects of the approved development other than the duration of mining operations. That is, the Modification will not increase the total coal production or disturbance footprint of Glendell's mining activities.

This Modification Report supports an application to modify DA 80/952 under Section 4.55(2) of the *Environmental Planning and Assessment Act 1979*.

IMPACT ASSESSMENT

The Modification does not involve any increase to the approved disturbance footprint, production rates or workforce. As such, the Modification will not exacerbate the impacts of Glendell Mine alone (i.e. no additional incremental impacts). The only consequence of the Modification is that the impacts of the remaining mining will occur between July 2024 and June 2026 (the extension period) rather than prior to June 2024. Accordingly, the focus of this environmental assessment is on cumulative impacts during the extension period, given that there may be changes to the surrounding developments in this period.

Air Quality

The mining activities that will occur during the proposed extension period were assessed in MOD4. The air quality assessment for MOD4 determined that the most sensitive location from an air quality perspective is the village of Camberwell, which is located to the south. The direction of mining is from south to north, which means that mining is progressively moving away from Camberwell. Consistent with the conclusions of the MOD4 assessment, air quality impacts during the extension period will be less than those previously experienced when mining was closer to Camberwell.

The MOD4 assessment considered all surrounding developments that have the potential to contribute to cumulative impacts. In addition to the surrounding developments previously considered, two recently proposed projects may affect cumulative impacts during the extension period:

- Hunter Valley Operations (HVO) Continuation Project; and
- Rix's Creek North Continuation Project.

HVO is an existing open cut mining operation located to the west of Glendell Mine. The existing activities at HVO contribute approximately 1 to 2 $\mu g/m^3$ to annual average PM_{10} concentrations in Camberwell (Jacobs, 2019). The HVO Continuation Project involves the progression of mining towards Camberwell. As a result, HVO's contribution to cumulative PM_{10} concentrations may increase to approximately 2 to 3 $\mu g/m^3$ (Jacobs, 2022).

Rix's Creek North Mine is an existing open cut mine located to the south of Glendell Mine. No air quality predictions for the Rix's Creek North Continuation Project are currently available. However, this project is unlikely to substantially alter the impacts of the existing Rix's Creek North Mine given that it does not propose an increase in coal production rate.

Liddell Coal Operations is an existing open cut mine located north of Glendell Mine and is also owned by a subsidiary of Glencore Coal Pty Limited. Although Liddell Coal Operations has approval to undertake mining until the end of 2028, current scheduling indicates that this operation may commence closure prior to June 2024. Contributions from Liddell Coal Operations were considered in the cumulative assessment for MOD4. The early closure of Liddell Coal Operations is effectively a reduction in cumulative impacts during the extension period compared to currently approved period of mining.

Although the HVO Continuation Project may increase that operation's impacts on Camberwell, the small magnitude of the increase is unlikely to result in exceedances of the cumulative air quality criteria at those private residences. Any additional impacts due to HVO Continuation Project may also be partially offset by the early closure of Liddell Coal Operations. Therefore, cumulative impacts on sensitive receivers during the extension period are expected to be similar to those during the approved mining period.

Noise

The most sensitive receivers from a noise perspective are the remaining private residences in Camberwell. Given that the direction of mining is away from Camberwell, impacts on these receivers during the extension period will be less than those experienced in the earlier stages of mining.

The '*Noise Policy for Industry*' (EPA, 2017) prescribes project amenity noise limits for the management of cumulative noise impacts. The project amenity noise limits are set at 5 dB(A) below the amenity criteria recommended by the '*Industrial Noise Policy*' (EPA, 2000). For the night period (which is the most sensitive), this would result in a project amenity noise limit of 35 dB(A). The maximum contribution of Glendell Mine to noise-time noise at Camberwell is predicted to be 33 dB(A). Therefore, Glendell Mine is expected to comply with the relevant noise criteria during the extension period.

The same conclusion would be reached if using the assessment framework under the '*Industrial Noise Policy*' (EPA, 2000). The recommended amenity criteria for the noise period is 40 dB(A). The predicted contribution from Glendell Mine is at least 7 dB(A) less than the amenity criteria and would not significantly affect cumulative noise levels.

Traffic

The primary access route for Glendell's workforce is via the New England Highway and Hebden Road. The New England Highway / Hebden Road intersection includes deceleration turn lanes for traffic travelling in both directions on the New England Highway. As such, traffic turning onto Hebden Road is unlikely to impede traffic flow along the New England Highway.

The Modification will not alter traffic volumes associated with Glendell Mine as it does not involve any increase in workforce or additional construction activities.

The HVO Continuation Project and Rix's Creek North Continuation Project may generate additional traffic on the local road network during the extension period. The HVO Continuation Project involves a construction phase (which will generate additional short-term traffic), whilst the Rix's Creek North Continuation Project involves a minor increase to the operational workforce. Traffic movements associated with those sites are unlikely to utilise Hebden Road. The New England Highway is a major transportation route and has sufficient capacity to accommodate additional traffic associated with those projects. Therefore, the Modification is not expected to lead to traffic impacts.

JUSTIFICATION

The Modification will enable recovery of the remaining coal reserves approved through MOD4. This would yield economic and employment benefits to the local and state economies.

The environmental assessments included in this Modification Report have determined that cumulative impacts during the extension period will be similar to those during the approved mining period, and are predicted to comply with the relevant air quality and noise criteria.

The Modification represents an efficient use of land because it maximises resource recovery from an existing mine. The ancillary infrastructure required for mining is already in place, thereby avoiding further impacts due to construction or land disturbance.

Given that the Modification would have economic benefits without exacerbating any environmental impacts, it can be concluded that the modified development would be in the public interest.

CONTENTS

TABLES

FIGURES

APPENDICES

1. INTRODUCTION

This section provides the background to the proposed Modification, introduces the proponent and outlines the purpose and structure of this Modification Report.

1.1 BACKGROUND

Glendell Mine (Glendell) is a coal mining operation located approximately 20 km north-west of Singleton in the Upper Hunter region (see . Glendell is a component of the Mount Owen Complex (MOC), a mining precinct which also includes the Mount Owen and Ravensworth East Mines. The MOC is managed by Mt Owen Pty Limited (MOPL), which is a subsidiary of Glencore Coal Pty Limited.

Glendell operates under Development Consent DA 80/952 granted under the *Environmental Planning and Assessment Act 1979* (EP&A Act). DA 80/952 enables the following mining activities to be undertaken:

- Extraction of up to 4.5 million tonnes per annum (Mtpa) of run of mine (ROM) coal using truck and excavator mining methods;
- Hauling of ROM coal to Mount Owen Mine for processing and transportation;
- Hauling of overburden and materials to and from Ravensworth East Mine;
- Transportation of up to 1 Mtpa of product coal to domestic power stations by conveyor;
- Ancillary surface infrastructure including offices, workshop, access roads, services and water management infrastructure; and
- Diversion of Bettys Creek and Swamp Creek.

DA 80/952 currently permits mining operations to be undertaken until the end of June 2024. MOPL seeks to modify DA 80/952 to extend mining operations by an additional two years until the end of June 2026 (the Modification).

The Mount Owen and Ravensworth East Mines operate under a separate development consent (SSD-5850). Although there are multiple synergies between Glendell and the Mount Owen and Ravensworth East Mines, the Modification will not alter the approved activities under SSD-5850.

1.2 APPROVAL HISTORY

DA 80/952 was originally granted on 2 May 1983 under the then Section 101 of the EP&A Act. At the time of the grant, Section 101 was a provision under Part 4 of the EP&A Act. DA 80/952 originally permitted mining operations to be undertaken until 2013 (i.e. 30 years of mining). The first modification (MOD1) to DA 80/952 was granted in 1997 and facilitated processing of Glendell's coal at the neighbouring Liddell Mine.

The second modification (MOD2) to DA 80/952 instituted changes to the mine plan and coal processing arrangements. MOD2 enabled ROM coal extracted from Glendell to be hauled to Mount Owen Mine for processing and transportation to end user. The conditions of DA 80/952 were contemporised upon approval of MOD2.

The currently approved development is represented by the activities approved through MOD2 and the later modifications to DA 80/952. The activities approved through these modifications are summarised in **Table 1**.

Table 1 Approved Activities under DA 80/952

Modification	Description	Date Modified
Modification 2	This modification proposed the following alterations: • Increase in production rate to 4.5 Mtpa of ROM coal; • Extension of mine life to 30 June 2024; • Alterations to the approved mine plan (without increasing the disturbance area or height of overburden emplacement areas); • Change in mining method to excavator and truck operations; • Use of an internal haul road to transport ROM coal to the MOC Mine Infrastructure Area; • Use of internal haul road for movement of overburden and materials to and from Ravensworth East Mine; • Integration of water management infrastructure with the system at MOC; • Integration of rejects and tailings management with the system at MOC; • Transportation of up to 1 Mtpa of product coal to domestic power stations using the Ravensworth East conveyor; • Relocation of the access road off Hebden Road; • Alterations to the Bettys Creek and Swamp Creek diversions; • Addition of a 200 ML mine water dam and pipeline; and • Relocation of offices, workshop and ancillary surface infrastructure.	25 February 2008
Modification 3 (MOD3)	This modification proposed the realignment of a 2.7 km section of an existing 132 kV Ausgrid powerline and associated activities	1 December 2016
Modification 4 (MOD4)	This modification proposed a minor expansion of the open cut mining area (Barrett Pit) to recover an additional 2.5 Mt of ROM coal.	4 March 2020

The approved activities under DA 80/952 (as modified) are shown in **Figure 2**.

1.3 OVERVIEW OF THE MODIFICATION

MOPL seeks to extend mining operations under DA 80/952 by an additional two years to enable completion of the approved mining activities. There is approximately 1.8 Mt of ROM coal remaining within the additional mining area approved through MOD4. The Modification is required to facilitate recovery of these coal reserves.

Condition 5 under Schedule 2 of DA 80/952 currently permits mining operations until the end of June 2024. The Modification seeks to amend this condition as follows (amendment in red):

> ***Limits on Consent***
>
> *5. Mining operations may take place until the end of June ~~2024~~2026.*

The Modification will not alter any aspects of the approved development other than the duration of mining operations. That is, the Modification will not increase the total coal production or disturbance footprint of Glendell's mining activities.

1.4 OBJECTIVES OF THE MODIFICATION

The additional two years of mining proposed by the Modification will enable recovery of the remaining coal reserves approved under DA 80/952.

Approximately 1.8 Mt of the coal reserves approved through MOD4 are unable to be extracted within the remaining period of mining (i.e. prior to 30 June 2024). The Modification will enable recovery of this coal, which will generate economic benefits to the local region and royalties for the NSW Government.

1.5 THE PROPONENT

The proponent of the Modification is MOPL, which has the following contact details:

Mt Owen Pty Limited
PO Box 320
Singleton NSW 2330

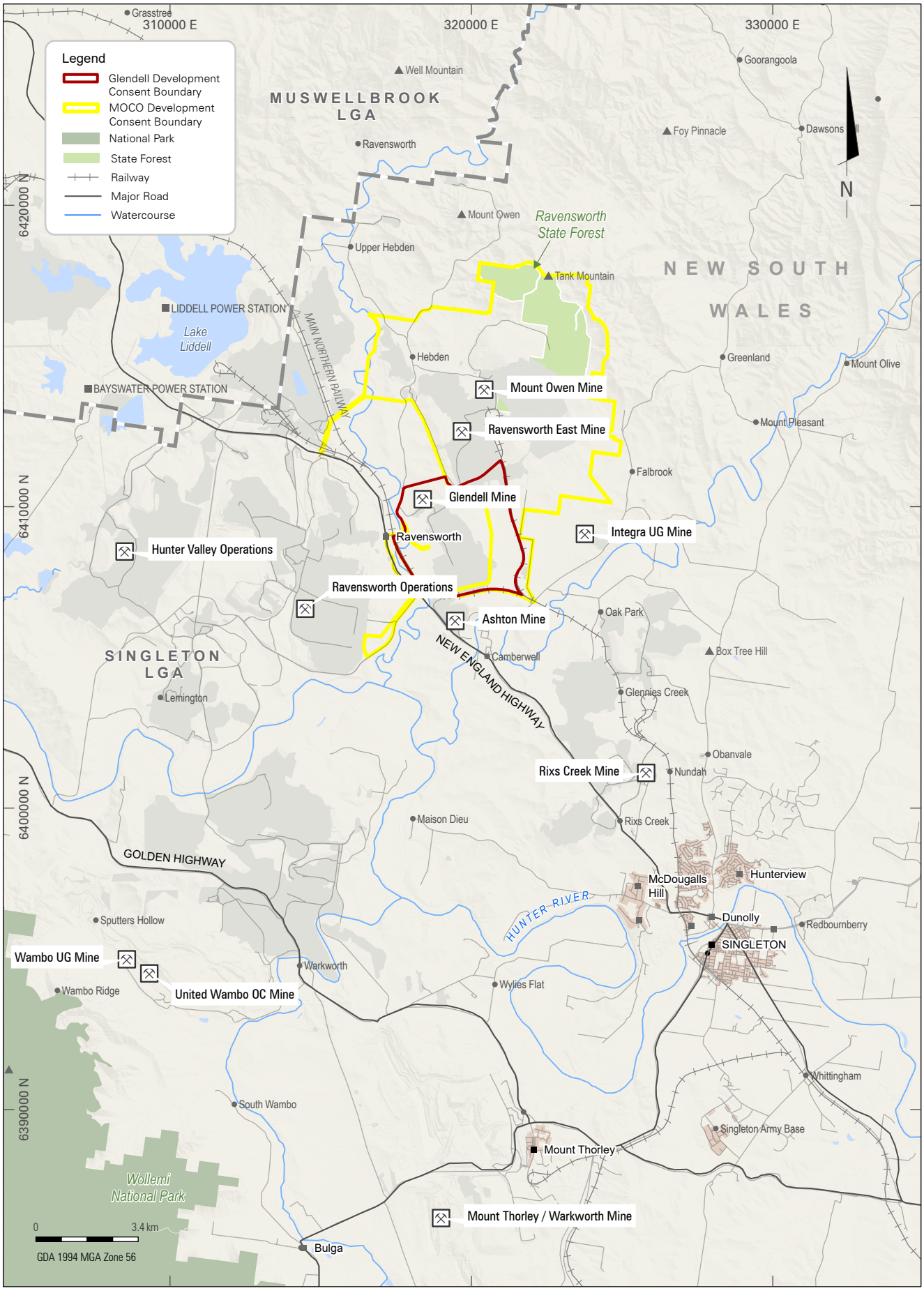
Phone: (02) 6570 0800
Fax: (02) 6576 1643
https://www.glencore.com.au/operations-and-projects/coal/current-operations/mt-owen-glendell-open-cut

1.6 DOCUMENT PURPOSE

The proponent is seeking to modify DA 80/952 under Section 4.55(2) of the EP&A Act. This modification report provides a description of the proposed Modification and assesses its potential environmental impacts, as required by Clause 100 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation).

1.7 DOCUMENT STRUCTURE

- **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.



JBA 2285 GLENDELL_F 01 REGIONAL LOCALITY.aprx

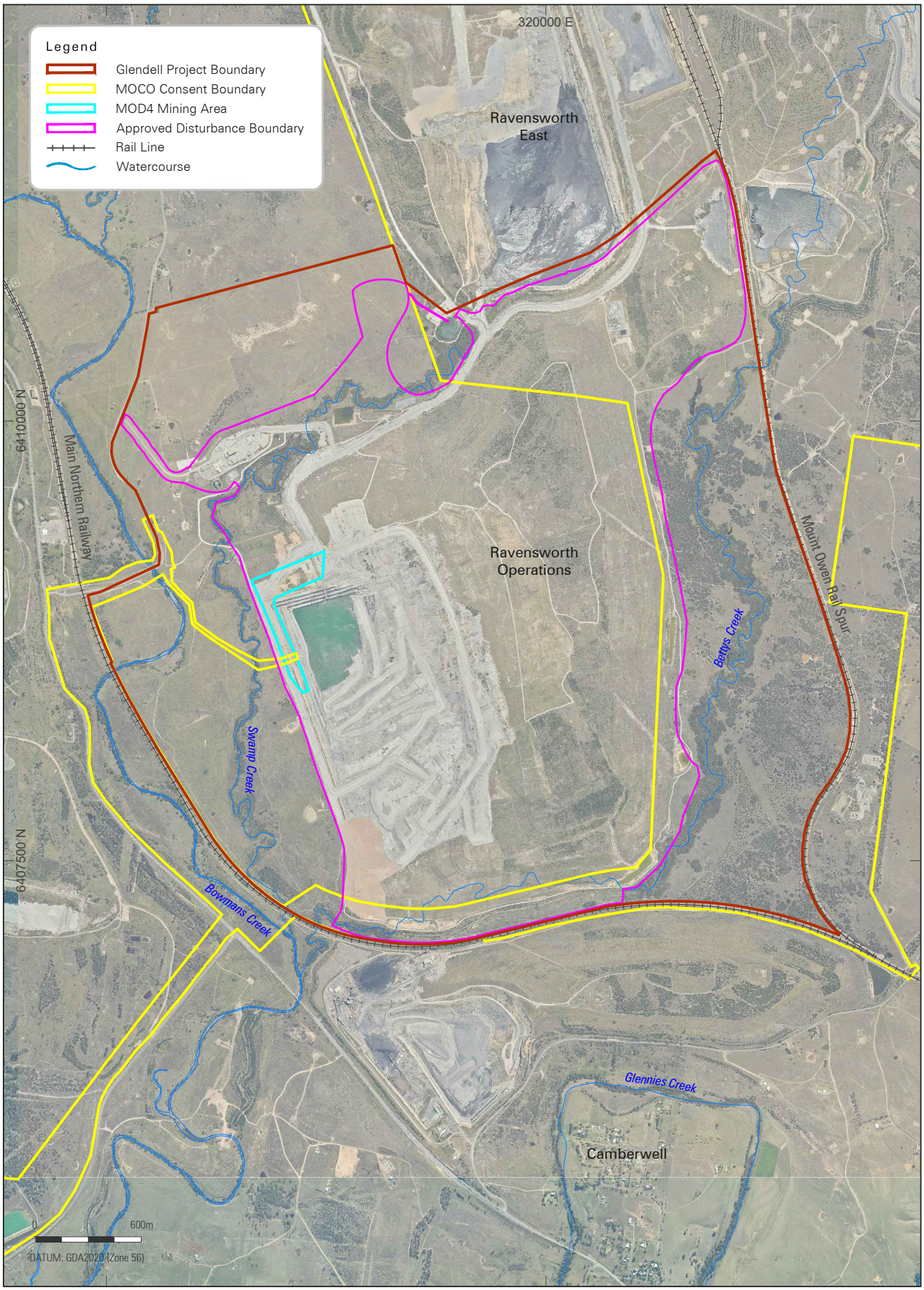
GLENDELL MINE

GLENCORE

JAMES BAILEY & ASSOCIATES
Environmental and Planning Consultants

Regional Locality

FIGURE 1



JBA 2285 GLENDELL_F 02 APPROVED DEVELOPMENT (18/12/2023)

GLENDELL MINE

GLENCORE

JAMES BAILEY & ASSOCIATES
Environmental and Planning Consultants

Approved Development Layout

FIGURE 2

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

Glendell is located within an industrial setting, with coal mining and associated power generation being the dominant land uses.

Glendell is neighboured by other Glencore operated mines including the other components of MOC, Integra Underground Mine, Ravensworth Operations, Liddell Coal Operations (LCO). These operations form a mining precinct known as the Greater Ravensworth Area and their common ownership facilitates operational synergies between these mines. The land associated with these mines is predominantly owned by subsidiaries of Glencore, although AGL Macquarie owns part of the land at Ravensworth Operations.

Ashton Mine and Rix's Creek North Mine are third-party owned mines located to the south of Glendell. These are owned by Ashton Coal Operations Pty Ltd and Bloomfield Collieries Pty Ltd, respectively.

AGL Macquarie operates the Bayswater Power Station located approximately 10 km north-west of Glendell. AGL Macquarie also owns the Liddell Power Station, which is currently in its decommissioning phase.

The major transport corridors in the region are the New England Highway and the Main Northern Rail Line. Both these corridors traverse to the west of Glendell.

The nearest settlement is the village of Camberwell, located approximately 1.1 km south of Glendell. Camberwell consists predominantly of mine-owned residences, although a small number of properties remain under private ownership. These private properties are subject to acquisition rights from other mining operations.

The nearest major townships are Singleton and Muswellbrook, both of which are more than 10 km from Glendell.

2.2 PLANNING CONSTRAINTS

2.2.1 Flood Prone Land

Glendell is not situated within any flood planning areas identified under the *Singleton Local Environmental Plan 2013* (Singleton LEP).

The Glendell mining area is bounded by Swamp Creek, Bettys Creek and Bowmans Creek (which are tributaries of the Hunter River). The 100-year average recurrence interval (ARI) flood extents of these watercourses were modelled by Umwelt (2014). The approved mining area is located outside of these 100-year ARI flood extents.

2.2.2 Bushfire Prone Land

Glendell is located on mapped bushfire prone land. There are three categories of bushfire prone land, 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.

Most of the bushfire prone land at Glendell is mapped as Vegetation Category 3. Most the active mining area is not mapped as bushfire prone land.

2.2.3 Mine Subsidence Districts

Glendell is located within the Patrick Plains Mine Subsidence District (MSD). Section 15 of the *Coal Mine Subsidence Compensation Act 2017* (CMSC Act) states that the approval of Mine Subsidence NSW is required for the erection or alteration of an "improvement" within an MSD. The Modification will not involve any changes to the existing infrastructure at Glendell. Therefore, there are no obligations that arise due to the Modification being located within the Patrick Plains MSD.

2.2.4 Other Matters

The Environment Protection Authority (EPA) maintains a register of contaminated land in NSW. Glendell is not located on or near a notified contaminated site. The Modification will be undertaken entirely on land that is currently used for mining operations. Therefore, the risk of land contamination due to previous land uses is not applicable to the Modification.

The Modification is not located on or near any land mapped as a landslide risk area.

2.3 PLANNING CONSIDERATIONS

2.3.1 Government Policies

The *Hunter Regional Plan 2041* (DPE, 2022) (HRP) outlines the State government's strategic land use objectives for the Hunter region. The HRP recognises that the mining and energy industries will "*remain important contributors to the regional economy into the future, generating employment which sustains our communities*".

Whilst acknowledging the importance of coal mining to regional economy, the HRP highlights the importance of developing alternative land uses for mine sites following closure. Following cessation of mining area, disturbed areas will be rehabilitated (except for the approved final void) to establish land suitable for agriculture and native ecosystems. The final landform and post-mining land use objective will not be altered by the Modification. Therefore, the Modification is consistent with the HRP's objective of finding post-mining uses for mine sites.

2.3.2 Cumulative Impacts

The following developments have been considered when assessing the cumulative impacts of the Modification:

- The other components of MOC;
- Ravensworth Operations;
- Hunter Valley Operations;
- Ashton Coal Mine; and
- Rix's Creek North Mine.

These developments are currently operating and therefore contributing to cumulative impacts during the approved period of mining. For assessment purposes, the impact of the Modification is represented by the change in cumulative impacts from the approved mining period (up to June 2024) to the proposed extension period (July 2024 to June 2026).

Given that the Modification will not increase the footprint or intensity of mining operations, Glendell's contribution to cumulative impacts will not increase. However, cumulative impacts are affected by changes to the surrounding developments. Some changes may reduce cumulative impacts (such as cessation or reduction in scale of surrounding activities), whereas other changes may increase cumulative impacts (such as new projects or expansions to existing activities).

Liddell Coal Operations (LCO) has approval to undertake mining operations until the end of 2028; however, it is scheduled to commence mine closure prior to June 2024. Emissions from LCO were considered in previous assessments of cumulative impacts. The early closure of LCO effectively acts as a reduction in cumulative impacts compared to what was previously predicted.

Two new State Significant Developments are currently proposed in the locality:

- Hunter Valley Operations (HVO) Continuation Project (SSD-11826621 and SSD-11826681); and
- Rix's Creek North Continuation Project (SSD-60774228).

The HVO Continuation Project is the subject of two separate applications because its constituent mines (HVO North and HVO South) are authorised under separate development consents. The HVO North Continuation (SSD-11826681) proposes to extend mining operations from 2025 until 2050, with combined production rate from HVO North and HVO South being unchanged from the current maximum of 22 Mtpa of ROM coal. The HVO South Continuation (SSD-11826621) seeks to extend mining operations from 2030 to 2050. The maximum production rate will slightly decrease compared to the approved operations (from 20 Mtpa to 18 Mtpa of ROM coal). Neither application proposes an increase to the operational workforce. The potential impacts of the HVO Continuation Project were assessed in the '*Hunter Valley Operations Continuation Project Environmental Impact Assessment*' (EMM, 2022).

The Rix's Creek North Continuation Project seeks to extend mining operations from 2035 to 2049. The maximum production rate will remain at the current limit of 6 Mtpa of ROM coal. The application also seeks an increase in the operational workforce from an average of 250 to 325 personnel (JBA, 2023). As at December 2023, the environmental impact assessment of the Rix's Creek North Continuation Project has not been completed.

The predicted cumulative impacts during the extension period are discussed in **Section 6**.

2.3.3 Planning Agreements

Glendell's impacts on council infrastructure and services have been addressed through development contributions in accordance with Schedule 2, Condition 12 of DA 80/952. Accordingly, DA 80/952 does not require Glendell to enter into any planning agreements.

3. DESCRIPTION OF THE MODIFICATION

This section describes the changes to the approved development that are sought by the Modification.

3.1 EXTENSION OF MINING OPERATIONS

Development Consent DA 80/952 permits the carrying out of mining operations until the end of June 2024. There is estimated to be 1.8 Mt of ROM coal remaining within the approved mining area which will not be able to be recovered within the approved period of mining. The Modification proposes to extend the duration of mining operations by an additional two years (i.e. until the end of June 2026) to enable recovery of the remaining coal reserves.

The proposed extension can be facilitated through the following amendment (shown in red) to Condition 5 under Schedule 2 of DA 80/952:

> ***Limits on Consent***
>
> *5. Mining operations may take place until the end of June ~~2024~~2026.*

The Modification will not involve any changes to the mining footprint, target coal reserves or production rates. Therefore, the Modification will only enable recovery of coal resources that are already approved for extraction under DA 80/952.

3.2 COMPARISON TO APPROVED OPERATIONS

As shown in **Table 2**, the Modification does not propose any changes to the approved development other than the duration of mining.

Table 2 Comparison of the Modification to the Approved Development

Aspect	Authorised Development	The Modification
Land use	Coal mining and ancillary activities	No change
Duration	Mining operations until end of June 2024	Mining operations until end of June 2026
Mining method	Open cut mining (truck and excavator)	No change
Production rate	Maximum production rate of 4.5 Mtpa of ROM coal	No change
Surface infrastructure	• ROM coal is processed and transported off-site using the facilities at Mount Owen Mine. • Infrastructure at Glendell includes the administration buildings, workshop, bathhouse, coal stockpiles, fuel storage area, vehicle wash bays, and services infrastructure. • Integrated water and tailings management with the other mines in the Greater Ravensworth Area Water and Tailings Scheme.	No change
Final landform	• The approved final landform includes a final void.	No change

Aspect	Authorised Development	The Modification
	• Other disturbed areas will be rehabilitated (with substantial treed vegetation).	
Operating hours	24 hours per day, 7 days per week	No change
Workforce	150 full time equivalent personnel	No change

3.3 ALTERNATIVES CONSIDERED

The only alternative to the Modification is the 'do nothing' scenario. If the Modification does not proceed, the remaining coal reserves within the approved mining area (approximately 1.8 Mt of ROM coal) would be sterilised. The potential economic benefits of recovering the remaining coal reserves include royalties to NSW, as well as expenditure and employment within the local area. These economic benefits would not be realised under the 'do nothing' scenario.

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 Legislative 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 would be 'substantially the same development' as the development approved under the existing consents/approvals (as explained in Section 4.2.1).
Permissibility	Singleton Local Environment Plan 2013 (Singleton LEP)	Glendell is located on land zoned as RU1 Primary Production. The Singleton LEP provides that open cut mining is permitted (with consent) on land within zone RU1.
Gateway process	Clause 103 of EP&A Regulation Clause 2.24 of *State Environmental Planning Policy (Resources and Energy) 2021* (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	Sections 5 & 6 of the *Mining Act 1992* (Mining Act)	Glendell's mining activities are located within mining leases granted under the Mining Act. Mining Lease 1476 and Miscellaneous Purposes Licence 343 will require renewal to enable continuation of mining activities throughout the proposed extension of mining.

4.2 KEY LEGAL MATTERS

4.2.1 Power to Modify

Section 4.55(2) of the EP&A Act gives a consent authority the power to modify a development consent. This power to modify is limited by the requirement for the modified development to be 'substantially the same development'. Section 4.55(2)(a) states that the consent authority may exercise its power to modify if:

> *"it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified (if at all)".*

Although Section 4.55 states that the modified development is to be compared to the 'original development' (i.e. before modifications), there is an exception for consents that have been modified under Section 75W. Clause 3BA(6) under Schedule 2 of the *Environmental Planning and Assessment Regulation (Savings, Transitional and Other Provisions) Regulation 2017* (EP&A Transitional Regulation) relevantly states (emphasis added):

> *(6) In the application of section 4.55(1A) or (2) or 4.56(1) of the Act to the following development, the consent authority need only be satisfied that the development to which the consent as modified relates is substantially the same development as the development authorised by the consent (as last modified under section 75W)—*

DA 80/952 was originally granted under Section 101 of the EP&A Act, which was provision under Part 4. Although the former Section 75W of the EP&A Act related primarily to modification of Part 3A approvals, Clause 8J(8) of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) allowed for development consents granted under Section 101 of the EP&A Act to be modified under Section 75W. Accordingly, MOD2 and MOD3 was granted under the former Section 75W.

The practical consequence of Clause 3BA(6) of the EP&A Transitional Regulation is that MOD2 is considered part of the approved development when considering if the modified development would be 'substantially the same development'.

DA 80/952 was originally granted in 1983 and authorised mining operations to be undertaken until 2013. That is, the original development involved 30 years of mining. MOD2 extended the period of mining operations until the end of June 2024. Given that MOD2 is considered part of the approved development, the approved duration of mining is therefore 41 years. The Modification proposes to extend mining operations by an additional two years. The modified development would involve 43 years of mining, which is not a substantial increase compared to the approved 41 years of mining. Therefore, the modified development would be 'substantially the same development' as the currently approved development, thereby satisfying the pre-requisite for modification under Section 4.55(2) of the EP&A Act.

5. STAKEHOLDER ENGAGEMENT

This section summarises the stakeholder consultation undertaken in relation to the Modification.

5.1 REGULATORY AUTHORITIES

MOPL has consulted with the Department of Planning and Environment (DPE) to confirm the appropriate approval pathway for the Modification and the scope of assessment required. DPE was consulted through the following engagement methods:

- Meeting on 26 October 2023;
- Scoping Request lodged on 27 October 2023; and
- Other correspondence.

The Scoping Request explained that since the Modification will not alter the impacts of Glendell Mine alone, the environmental assessment of the Modification should be limited to consideration of cumulative impacts during the proposed two-year extension period. DPE agreed with this suggested scope of assessment.

It was confirmed through consultation that the proposed two-year extension could be dealt with under Section 4.55 of the EP&A Act. DPE deemed that the Modification does not meet the criteria of "minimal environmental impact" required for modification under Section 4.55(1A) of the EP&A Act and that it should instead be assessed under Section 4.55(2).

5.2 COMMUNITY CONSULTATION

MOPL has informed the relevant community stakeholders of the Modification through the following engagement methods:

- Meeting with the Mount Owen Complex and Integra Underground Mine Community Consultative Committee (CCC) on 26 October 2023;
- Discussion with registered Aboriginal parties (RAPs) on 1 December 2023;
- Local community newsletter distributed on 13 December 2023; and
- Greater Ravensworth Newsletter distributed on 14 December 2023.

The Modification does not involve any additional surface disturbance and therefore will not result in further impacts to Aboriginal items. Nevertheless, the RAPs were notified of the Modification as a matter of courtesy.

No community stakeholders have raised concerns or matters for further consideration.

6. IMPACTS, MANAGEMENT AND MITIGATION

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

6.1 AIR QUALITY

6.1.1 Background

Airen Consulting has undertaken an Air Quality and Greenhouse Gas Assessment of the Modification, which considers potential impacts during the proposed extension period. This assessment is provided in **Appendix A**.

The primary pollutant of concern for mining operations is particulate matter (PM), which is measured through PM_{10}, $PM_{2.5}$, total suspended particulates (TSP) and deposited dust. The Modification will not alter the nature of air quality impacts and therefore does not warrant consideration of any other pollutants.

Schedule 3, Condition 20 of DA 80/952 prescribes air quality criteria for the private receivers in the vicinity of Glendell (as reproduced in **Table 4**). The criteria in DA 80/952 are consistent with current regulatory requirements, although dust deposition criteria have been omitted from more recently granted development consents.

Table 4 Air Quality Criteria

Air quality indicator	Averaging time	Criterion	Application
Particulate matter (PM_{10})	24-hour	50 µg/m³	Cumulative, at sensitive receptors
	Annual	25 µg/m³	Cumulative, at sensitive receptors
Particulate matter ($PM_{2.5}$)	24-hour	25 µg/m³	Cumulative, at sensitive receptors
	Annual	8 µg/m³	Cumulative, at sensitive receptors
Particulate matter (TSP)	Annual	90 µg/m³	Cumulative, at sensitive receptors
Deposited dust	Annual (maximum increase)	2 g/m²/month	Incremental, at sensitive receptors
	Annual (maximum total)	4 g/m²/month	Cumulative, at sensitive receptors

The nearest private receptors are located to the south of Glendell within the village of Camberwell. Mining within the Barrett Pit is progressing in a south to north direction and is therefore moving away from Camberwell. Mining activities during the proposed extension period will occur in the northernmost extent of the approved mining area. Future impacts will be less than those previously experienced when mining was closer to Camberwell.

6.1.2 Cumulative Air Quality

Jacobs (2019) assessed the potential air quality impacts of MOD4, which represents the most recent assessment of impacts for the approved Glendell Mine. This assessment considered the following surrounding developments in its consideration of cumulative impacts:

- The other components of the Mount Owen Complex approved under SSD-5850 (including Modification 2);
- Ashton Coal Mine including the Ashton South East Open Cut Project (which was approved but not commenced);
- The approved operations at HVO North (DA 450-10-2003) and HVO South (MP 06_0261);

- Ravensworth Operations;
- LCO; and
- Rixs Creek North Mine (MP 08_0102) and Rixs Creek South Mine (SSD 6300).

The assessment by Jacobs (2019) did not consider the HVO Continuation Project or Rix's Creek North Continuation (see **Section 2.3.2**), as these were not yet proposed at the time of assessment. The modelling conducted by Jacobs (2019) determined that the approved HVO mines contribute approximately 1 to 2 µg/m^3 to annual average PM_{10} concentrations in Camberwell. The air quality assessment for the HVO Continuation Project predicted that this contribution to cumulative concentrations at Camberwell may increase to approximately 2 to 3 µg/m^3 (Jacobs, 2022). The predicted increase is due to HVO North's proposed mining activities being closer to Camberwell.

No air quality predictions for the Rix's Creek North Continuation Project are currently available, as the environmental impact statement for that project has not yet been completed. However, the project is unlikely to substantially alter the impacts of the existing Rix's Creek North Mine given that it does not propose an increase in coal production rate.

As explained in **Section 2.3.2**, LCO is scheduled to commence mine closure prior to June 2024, despite having approval to conduct mining until the end of 2028. The early closure of LCO is effectively a reduction in cumulative impacts during the extension period compared to the currently approved period of mining.

Although the HVO Continuation Project may increase that operation's impacts on Camberwell, the small magnitude of the increase is unlikely to result in exceedances of the cumulative air quality criteria at those private residences. Any additional impacts due to the HVO Continuation Project may also be partially offset by the early closure of LCO. Therefore, cumulative impacts on sensitive receivers during the extension period are expected to be similar to those during the approved mining period.

Greenhouse Gas

The Modification will only entail extraction of coal that was approved through MOD4. As a result, the Modification will not materially alter the total greenhouse gas (GHG) emissions generated over the mine life. However, the proposed extension will result in some emissions occurring between July 2024 and June 2026 rather than before June 2024. Due to this change in timeframe, the potential emissions for the 2025 and 2026 financial years were calculated (as presented in **Table 5**).

Table 5 Predicted GHG Emissions during the Extension Period

Activity	Usage	Emission factor (kg CO_2-e/unit)			Emission (t CO_2-e/y)			
		Scope 1	Scope 2	Scope 3	Scope 1	Scope 2	Scope 3	Total
FY 2025								
Diesel	8,944 kL	2709.72	0	667.78	24,237	0	5,973	30,210
Fugitive emissions	700,000 t ROM	0.007	0	0	4,891	0	0	4,891
Electricity	361,599 kWh	0	0.49*	0.04	0	177	14	192
Rail	410,000 t	0	0	6.666	0	0	2,733	2,733
Shipping	410,000 t	0	0	28.312	0	0	11,08	11,608
Energy	410,000 t	0	0	2436.48	0	0	998,957	998,957
Total	-	-	-	-	**29,128**	**177**	**1,019,285**	**1,048,590**
FY 2026								
Diesel	14,056 kL	2709.72	0	667.78	38,087	0	9,386	47,473

Activity	Usage	Emission factor (kg CO_2-e/unit)			Emission (t CO_2-e/y)			
		Scope 1	Scope 2	Scope 3	Scope 1	Scope 2	Scope 3	Total
Fugitive emissions	1,100,000 t ROM	0.007	0.39*	0	7,686	0	0	7,686
Electricity	568,227 kWh	0	0.49*	0.04	0	222	17	239
Rail	650,000 t	0	0	6.666	0	0	4,333	4,333
Shipping	650,000 t	0	0	28.312	0	0	18,403	18,403
Energy	650,000 t	0	0	2436.48	0	0	1,583,712	1,583,712
Total	-	-	-	-	**45,773**	**222**	**1,615,851**	**1,661,845**

** Scope 2 emissions estimates utilise grid greening assumptions consistent with DCCEEW (2022). The progressive reduction in emissions over time is an externality which is beyond the control of the proponent.*

All ROM coal extracted by Glendell is processed at the Mount Owen Coal Handling and Preparation Plant (CHPP). Coal processing is approved under the Mount Owen Continued Operations (MOCO) Development Consent (SSD-5850) and as such, GHG emissions associated with coal processing are attributed to that development. However, for the purposes of the National Greenhouse and Energy Reporting Scheme (NGERS), MOC is treated as a single facility. Therefore, GHG emissions due to processing of Glendell's coal will be reported in the NGERS.

6.2 NOISE

6.2.1 Background

Umwelt has undertaken a Noise Impact Assessment of the Modification, which considers potential impacts during the proposed extension period. This assessment is provided in **Appendix B**.

Previous noise assessments have determined that the areas to the south and south-east of Glendell are the most affected by noise from the development. As such, private residences in Camberwell are the most affected receivers from a noise perspective. Glendell has already acquired the residences that are entitled to acquisition under DA 80/952. The remaining private residences in Camberwell are entitled to acquisition upon request to other mining operations.

Schedule 3, Condition 2 of DA 80/952 prescribes noise criteria for the private receivers in the vicinity of Glendell. The intrusive criteria ($L_{Aeq,\ 15\ min}$) for receivers in Camberwell vary from 37-42 dB(A).

Advitech (2007) conducted a noise impact assessment of the approved MOD2, which included noise modelling of five representative stages in the mine plan (Years 1.5, 3, 6, 9 and 12). The modelled scenario for Year 12 is similar to the current progress of mining at Glendell. As such, the model results for Year 12 may be used to predict noise levels during the extension period.

Umwelt (2018) assessed the potential noise impacts of MOD4, which encompasses the area that is proposed to be mined during the extension period.

Due to mining operations progressing towards the north, noise impacts at the nearest receivers during the extension period will be less than those experienced when mining was closer to Camberwell.

6.2.2 Incremental Noise

The Advitech (2007) modelling for Year 12 predicted that receivers in Camberwell may experience noise levels of 37-38 $L_{Aeq,15\ minute}$ dB(A) under worst case weather conditions. These predicted levels are within the intrusive noise criteria prescribed by DA 80/952.

Open cut mining during the extension period can broadly be categorised into three activities:

- Construction of haul roads;
- Drilling; and
- Campaign mining (coal and overburden movement).

The equipment fleet used during the extension period will be consistent with the assumptions of the MOD2 and MOD4 assessment. Given that the remaining coal (~1.8 Mt) being less than the approved maximum production rate of 4.5 Mtpa, it is likely that actual equipment used during the extension period is less than what has been assumed in previous noise assessments.

Umwelt has used the modelling conducted for MOD2 and the MOD4 analysis to predict noise levels at Camberwell due to Glendell's future operations. The predicted $L_{Aeq,\ 15\ min}$ noise levels at the most-affected receivers are presented in **Table 6**. It is unlikely that road construction, drilling and campaign mining will all occur at the same time. Even if it is conservatively assumed that these activities occur concurrently, the worst-case noise level at a private receiver is predicted to be 39 dB(A), which is within the criteria for that receiver.

Table 6 Predicted Intrusive Noise Levels ($L_{Aeq,15\ minute}$) for the Modification

Receiver Location	Road Construction	Drilling Program	Campaign Mining	Combined Activities
21 – 23 Dulwich Place Camberwell	33	28	35	36
24 – 36 Lethbridge Street Camberwell	33	28	35	36
27 – 76 McInerney Road Camberwell	32	27	34	35
31 – 6 Dawson Street Camberwell	32	27	34	35

6.2.3 Cumulative Noise

Under the '*Industrial Noise Policy*' (EPA, 2000) (INP), cumulative noise was regulated using amenity criteria for the day, evening and night periods. The INP recommended criteria of 50 dB(A) for the day, 45 dB(A) for the evening and 50 dB(A) for the night. Advitech (2007) adopted project-specific night criteria for Camberwell that are higher than 40 dB(A). These higher criteria were adopted to account for the influence of traffic noise from the New England Highway.

Glendell's predicted contributions to cumulative noise levels during the extension period are presented in **Table 7**. The noise levels in **Table 7** are lower than those in **Table 6** due to noise levels being averaged over the entire period (day, evening or night) rather than the worst-case 15 minute interval.

Table 7 Predicted Contributions to Cumulative Noise Levels ($L_{Aeq,\ period}$)

Receiver Location	Road Construction	Drilling Program	Campaign Mining	Combined Activities
21 – 23 Dulwich Place Camberwell	30	25	32	33
24 – 36 Lethbridge Street Camberwell	30	25	32	33
27 – 76 McInerney Road Camberwell	29	24	31	32
31 – 6 Dawson Street Camberwell	29	24	31	32

Glendell's predicted contributions to cumulative noise levels are at least 7 dB(A) less than the amenity criteria. This margin is even greater if Advitech's (2007) project-specific noise criteria are considered. Regardless, noise levels that are 7 dB(A) less than the amenity criteria are unlikely to contribute significantly to cumulative noise.

The EPA has more recently introduced the '*Noise Policy for Industry*' (EPA, 2017) (NPfI). The NPfI manages cumulative noise through project amenity noise limits. These limits are 5 dB(A) lower than the amenity criteria recommended by the INP. The rationale is that if noise from a single industrial source is at least 5 dB(A) less

than the amenity criteria, its contribution to cumulative levels will not be significant. The project amenity noise limit for the noise period would therefore be 35 d(A). Given that Glendell is not predicted to contribute more than 33 dBA, it would comply with the project amenity noise limits recommended by the NPfI.

Therefore, the Modification is not expected to contribute significantly to cumulative noise levels. This conclusion has been reached using the cumulative assessment methodologies under both the INP and NPfI.

6.3 TRAFFIC

The primary access route for Glendell's workforce is via the New England Highway and Hebden Road. The New England Highway is the major transport corridor in the Hunter region. The section of highway between Singleton and Muswellbrook supports approximately 12,000 passenger vehicle movements per day (Transport & Urban Planning, 2013).

Hebden Road is a local road maintained by Singleton Council. Traffic counts undertaken for the MOCO Project determined that Hebden Road experiences approximately 1,300 vehicle movements per day (Transport & Urban Planning, 2013), most of which are associated with the MOC (including Glendell).

The New England Highway / Hebden Road intersection includes deceleration turn lanes for traffic travelling in both directions on the New England Highway. As such, traffic turning onto Hebden Road is unlikely to impede traffic flow along the New England Highway.

The Modification does not propose to increase Glendell's workforce. As such, the Modification will not increase traffic volumes on the routes used by Glendell personnel.

The HVO Continuation Project and Rix's Creek North Continuation Project (as summarised in **Section 2.3.2**) are currently proposed but not approved. For cumulative assessment purposes, it is conservatively assumed that both the projects will commence within the proposed extension period (July 2024 to July 2026). The HVO Continuation Project does not involve an increase in operational workforce; however, there may be a construction workforce of up to 600 personnel. The Rix's Creek North Continuation Project proposes to increase the operational workforce by 75 personnel. The additional traffic generated by these projects is unlikely to utilise Hebden Road, as that is not an efficient route to access either site. If these projects proceed, there would be an increase in cumulative traffic volumes on the New England Highway. However, the New England Highway is designed to be a major transport corridor and additional traffic due to developments during the extension period are unlikely to result in significant traffic issues. Furthermore, any increases in traffic due to proposed developments will be at least partly offset by the early closure of LCO.

7. EVALUATION

7.1 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The principles of ecologically sustainable development (ESD) are described in Section 6(2) of the *Protection of the Environment Administration Act 1991*. **Table 8** lists the four principles of ESD and explains how the modified development would continue to satisfy these principles.

Table 8 Principles of Ecologically Sustainable Development

Principle	Application to the Modified Project
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 potential environmental impacts of the Modification have been assessed by appropriately qualified specialists. As such, the precautionary principle does not apply as this is not a case where there is lack of scientific certainty. In any event, appropriate controls have been adopted to minimise environmental impacts.
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.	The Modification facilitates recovery of thermal coal which is required to meet the energy needs of the current generation. This coal is already approved for extraction and therefore does not represent any additional greenhouse gas contribution. Upon completion of mining, disturbed areas will be rehabilitated in accordance with the approved final landform to enable future generations to use the land.
Conservation of biological diversity and ecological integrity—namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.	The Modification will not result in any additional vegetation disturbance.
Improved valuation, pricing and incentive mechanisms—namely, that environmental factors should be included in the valuation of assets and services	The modified development is consistent with the 'polluter pays' principle for the following reasons: • The proponents bear the cost of all environmental controls, including monitoring and biodiversity offsets; and • The proponents compensate for their social impacts through their VPAs (see Section 2.2.3) and other contributions (including mining royalties and company tax).

7.2 MERIT EVALUATION

The primary objective of the Modification is to enable completion of the approved mining activities under DA 80/952. This will facilitate recovery of approximately 1.8 Mt of ROM coal, which would otherwise be sterilised if the Modification does not proceed. The recovery of this coal will yield royalties to NSW, and expenditure and employment benefits within the local area.

Given that the Modification will not alter the approved mining activities, the incremental impacts of Glendell Mine will not increase beyond currently approved levels. The extension proposed by the Modification would result in these incremental impacts occurring over a different time horizon. Accordingly, cumulative impacts have been re-assessed for the two year period from July 2024 to June 2026. As summarised in **Section 6**, these assessments have determined that the cumulative impacts during the extension period will be similar to those during the approved mining period and are consistent with the relevant air quality and noise criteria.

Given that the Modification would have material economic benefits without exacerbating any environmental impacts, the modified development would be in the public interest.

REFERENCES

- Advitech (2007). *Noise Impact Assessment: Glendell Mine Modifications to Development Consent.*
- Department of Planning and Environment (2022). *Hunter Regional Plan 2041.*
- EMM (2022). *Hunter Valley Operations Continuation Project Environmental Impact Assessment.*
- Jacobs (2019). *Glendell Mine Modification 4 – Air Quality Assessment.*
- Jacobs (2022). *Hunter Valley Operations Continuation Project – Air Quality and Greenhouse Gas Assessment.*
- NSW Environmental Protection Authority (2017). *Noise Policy for Industry.*
- Transport & Urban Planning Pty Ltd (2013). *Mount Owen Continued Operations Project: Traffic Impact Assessment*.
- Umwelt (2014). *Surface Water Assessment: Mount Owen Continued Operations Project*.
- Umwelt (2018). *Glendell Mine Modification 4: Statement of Environmental Effects.*

ABBREVIATIONS

Abbreviation	Meaning
ARI	Average Recurrence Interval
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
CMSC Act	*Coal Mine Subsidence Compensation Act 2017*
CIV	Capital Investment Value
DA	Development Application
dB(A)	A-weighted decibels
DPE	Department of Planning & Environment
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)
ESD	Ecologically sustainable development
g/m²/month	Grams per metres squared per month
GHG	Greenhouse Gas
Glendell	Glendell Mine
HRP	*Hunter Regional Plan 2041*
HVO	Hunter Valley Operations
INP	*Industrial Nois Policy 2000*
kg CO_2-e/unit	Kilograms of carbon dioxide emissions per unit
km	Kilometre
kV	Kilovolt
$LA_{eq,\ 15\ min}$	Average sound pressure level over a 15-minute period
LCO	Liddel Coal Operations
Mining Act	*Mining Act 1992*
ML	Megalitres
MOC	Mount Owen Complex
MOCO	Mount Owen Continued Operations
MOD1	First Modification to DA 80/952
MOD2	Second Modification to DA 80/952
MOD3	Third Modification to DA 80/952
MOD4	Fourth Modification to DA 80/952
MOPL	Mt Owen Pty Limited
MSD	Mine Subsidence District
Mt	Million tonnes

Abbreviation	Meaning
Mtpa	Million tonnes per annum
NGERS	National Greenhouse and Energy Reporting Scheme
NPfI	*Noise Policy for Industry 2017*
NSW	NSW
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter with a diameter of 10 micrometres
PM_{10}	Particulate Matter with a diameter of 10 micrometres
RAPs	Registered Aboriginal Parties
Resources and Energy SEPP	*State Environmental Planning Policy (Resources and Energy) 2021*
SEPP	State Environmental Planning Policy
Singleton LEP	*Singleton Local Environmental Plan 2013*
t CO_2-e/y	Tonnes of carbon dioxide emissions per year
TSP	Total Suspended Particulates

APPENDIX A

AIR QUALITY AND GREENHOUSE GAS ASSESSMENT

ABN 44 646 147 579
127 Gosford Road
Adamstown NSW 2289
T +61 (0) 419 239 687

19 December 2023

Andrew Wu
Senior Environmental Engineer
James Bailey & Associates Pty Ltd
6/127-129 John Street
Singleton NSW 2330

Project number: 23067

Dear Andrew

Air Quality and Greenhouse Gas Assessment of Glendell Modification 5

Please see attached for the assessment of potential air quality and greenhouse issues relating to Glendell Modification 5.

Yours sincerely

Shane Lakmaker
Director / Atmospheric Scientist
shane.lakmaker@airen.com.au

1. Background

Glendell Mine (Glendell) is a coal mining operation located approximately 20 kilometres (km) northwest of Singleton in the Upper Hunter region. Glendell is a component of the Mount Owen Complex (MOC), a mining precinct which also includes the Mount Owen and Ravensworth East Mines. The MOC is managed by Mt Owen Pty Limited (MOPL) which is a subsidiary of Glencore Coal Pty Limited.

Glendell operates under Development Consent DA 80/952 granted under the *Environmental Planning and Assessment Act 1979*. DA 80/952 enables mining operations to be carried out until the end of June 2024. DA 80/952 was originally granted by the then Minister for Planning and Environment on 2 May 1983.

DA 80/952 was then modified under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 25 February 2008. This modification was supported by an Environmental Assessment for the Modification of Glendell Mine Operations (Umwelt, 2007) and permitted mining operations to take place until the end of June 2024. The 2008 modification generally permitted the following changes to operations and infrastructure at Glendell:

- Extraction of up to 4.5 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal using existing and approved MOC services and infrastructure.
- Integration of the management of Glendell into the MOC.
- Relocation of mine infrastructure area and access road.
- Extension of the mining operations to 2024.
- Mining in a general north to south direction.

Construction of Glendell Mine commenced in April 2008 with the first coal extracted in June 2008. The most recent Modification (MOD 4 in 2020) included minor changes to the mine plan along the northern and western limit to access an additional 2.5 Mt of ROM coal and to allow for an additional approximately eight months of mining. The approved activities up to and including MOD 4 represent the Approved Operation.

MOPL is seeking a modification to DA 80/952 to extend mining operations by an additional two years until the end of June 2026 (the Modification). The Modification (MOD 5) is required to enable completion of the approved mining under DA 80/952 which will not be completed by June 2024. The Modification will facilitate extraction of the remaining coal reserves within the limits of the approved mining area, which is approximately 1.8 million tonnes (Mt) of ROM coal. The remaining coal reserves will entail approximately 6-12 months of active mining within the proposed extension period.

The Modification will not alter any aspects of the approved development other than the period of mining operations. The Modification will not increase the approved disturbance boundary, production rate or total coal recovery under the Development Consent.

This report provides an assessment of the potential air quality and greenhouse gas issues relating to the Modification. Given that the Modification does not propose any enlargement or intensification of mining, the incremental impacts of Glendell will not vary from that of the Approved Operation. As such, this assessment has primarily focused on potential cumulative impacts due to mining operations extending into a new timeframe (i.e. July 2024 to June 2026). Greenhouse gas emissions have also been re-calculated for the new mining timeframe.

2. Assessment Approach

Air quality issues can arise when emissions from an industry or activity lead to deterioration in the ambient air quality. Emissions from Glendell (both the Approved Operation and the Modification) will occur from a variety of activities including material handling, material transport, wind erosion, blasting and potentially from the spontaneous combustion of coal. These emissions will mainly comprise of particulate matter in the form of total suspended particulates (TSP), particulate matter with equivalent aerodynamic diameter of 10 microns or less (PM_{10}) and particulate matter with equivalent aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$). There would also be relatively minor emissions from machinery exhausts such as carbon monoxide (CO), oxides of nitrogen (NO_x) and particulate matter. Spontaneous combustion of coal has historically not been an issue at Glendell and is not expected to be an issue going forward and therefore is not assessed as having a potential impact.

The air quality impacts of the Approved Operation have been quantified most recently by Jacobs (2019). Changes to air emissions and potential impacts associated with the Modification will only result from the proposed extension to mining operations by an additional two years and changes in cumulative impacts due to changes in neighbouring operations not previously considered. The Modification does not involve any activity that will change the nature of air quality issues at Glendell, relative to the Approved Operations. In particular, the primary air quality issue will remain as particulate matter (TSP, PM_{10}, $PM_{2.5}$ and deposited dust) due to mining and combustion sources.

The assessment of air quality and greenhouse gas issues for the Modification involved:

- Identifying the relevant air quality assessment criteria.
- Examining the existing air quality environment with a particular emphasis on changes in air quality conditions since the most recent air quality assessment for Glendell (Jacobs, 2019).
- Reviewing previous assessments for Glendell and the wider Mount Owen Complex.
- Review publicly available information for surrounding developments to determine their anticipated activities and potential for changes in cumulative dust impacts during the extension period (July 2024 to June 2026). This includes both approved operations and proposed developments.
- Quantifying greenhouse gas emissions for the extension period.

The previous assessments and operations that were reviewed to inform the evaluation of cumulative impacts included:

- Ashton Coal Underground (DA 309-11-2001-i) and Ashton Coal Southeast Open Cut.
- Hunter Valley Operations North (DA 450-10-2003) and Hunter Valley Operations South (MP 06_0261).
- Liddell Mine (DA 305-11-01).
- Glendell MOD 4 (DA 80/952).
- Mt Owen Mine MOD 2 (SSD-5850).
- Ravensworth Mine (09_0176).
- Rixs Creek North Mine (MP 08_0102) and Rixs Creek South Mine (SSD 6300).

3. Assessment Criteria

Air quality is typically quantified by the concentrations of substances in the ambient air. Air pollution occurs when the concentration (or some other measure of intensity) of one or more substances known to cause health, nuisance and/or environmental effects, exceeds a certain level. With regard to human health and nuisance effects, the substance most relevant to Glendell has been identified, from Section 2, as particulate matter.

Schedule 3, Condition 20 of DA 80/952 requires MOPL to "ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria listed in Tables 8, 9 and 10 at any residence on privately-owned land, except for the residences shown in Table 1 as being eligible for acquisition on request on the basis of air quality impacts". Table 1 shows the air quality impact assessment criteria from DA 80/952. These criteria are consistent with criteria from contemporary development consents, except for deposited dust which is no longer included.

Table 1 Air quality impact assessment criteria from DA 80/952

Air quality indicator	Averaging time	[d] Air quality criteria from Planning Approval
Particulate matter (PM_{10})	24-hour	[b] 50 µg/m³
	Annual	[a] 30 µg/m³
Particulate matter (TSP)	Annual	[a] 90 µg/m³
Deposited dust [c]	Annual (maximum increase)	[b] 2 g/m²/month
	Annual (maximum total)	[a] 4 g/m²/month

[a] Total impact (ie increase in concentrations due to the development plus background concentrations due to all other sources);
[b] Incremental impact (ie increase in concentrations due to the development on its own);
[c] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.
[d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed to by the Secretary.

The Environment Protection Authority (EPA) has developed assessment criteria for a range of air quality indicators including particulate matter. These criteria are outlined in the "Approved Methods for the Modelling and Assessment of Air Pollutants in NSW" (EPA, 2022). New projects are assessed against the EPA criteria shown in Table 2. These criteria apply to existing and potentially sensitive receptors, where the Approved Methods defines a sensitive receptor as including "a location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area".

Table 2 Air quality assessment criteria for all relevant air quality indicators

Air quality indicator	Averaging time	Criterion	Application
Particulate matter (PM_{10})	24-hour	50 µg/m³	Cumulative, at sensitive receptors
	Annual	25 µg/m³	Cumulative, at sensitive receptors
Particulate matter ($PM_{2.5}$)	24-hour	25 µg/m³	Cumulative, at sensitive receptors
	Annual	8 µg/m³	Cumulative, at sensitive receptors
Particulate matter (TSP)	Annual	90 µg/m³	Cumulative, at sensitive receptors
Deposited dust	Annual (maximum increase)	2 g/m²/month	Incremental, at sensitive receptors
	Annual (maximum total)	4 g/m²/month	Cumulative, at sensitive receptors

Source: EPA, 2022.

The EPA air quality assessment criteria relate to the total concentration of pollutants in the air (that is, cumulative) and not just the contribution from project-specific sources. Therefore, consideration of background levels needs to be undertaken when using these criteria to assess the potential impacts.

4. Existing Environment

The existing environment can be characterised from local meteorological and ambient air quality data. MOPL has a network of meteorological and ambient air quality monitoring equipment that is used to collect data for supporting the management of daily operations at the MOC including Glendell (Figure 1). The data are also used for determining compliance against the relevant development consent conditions.

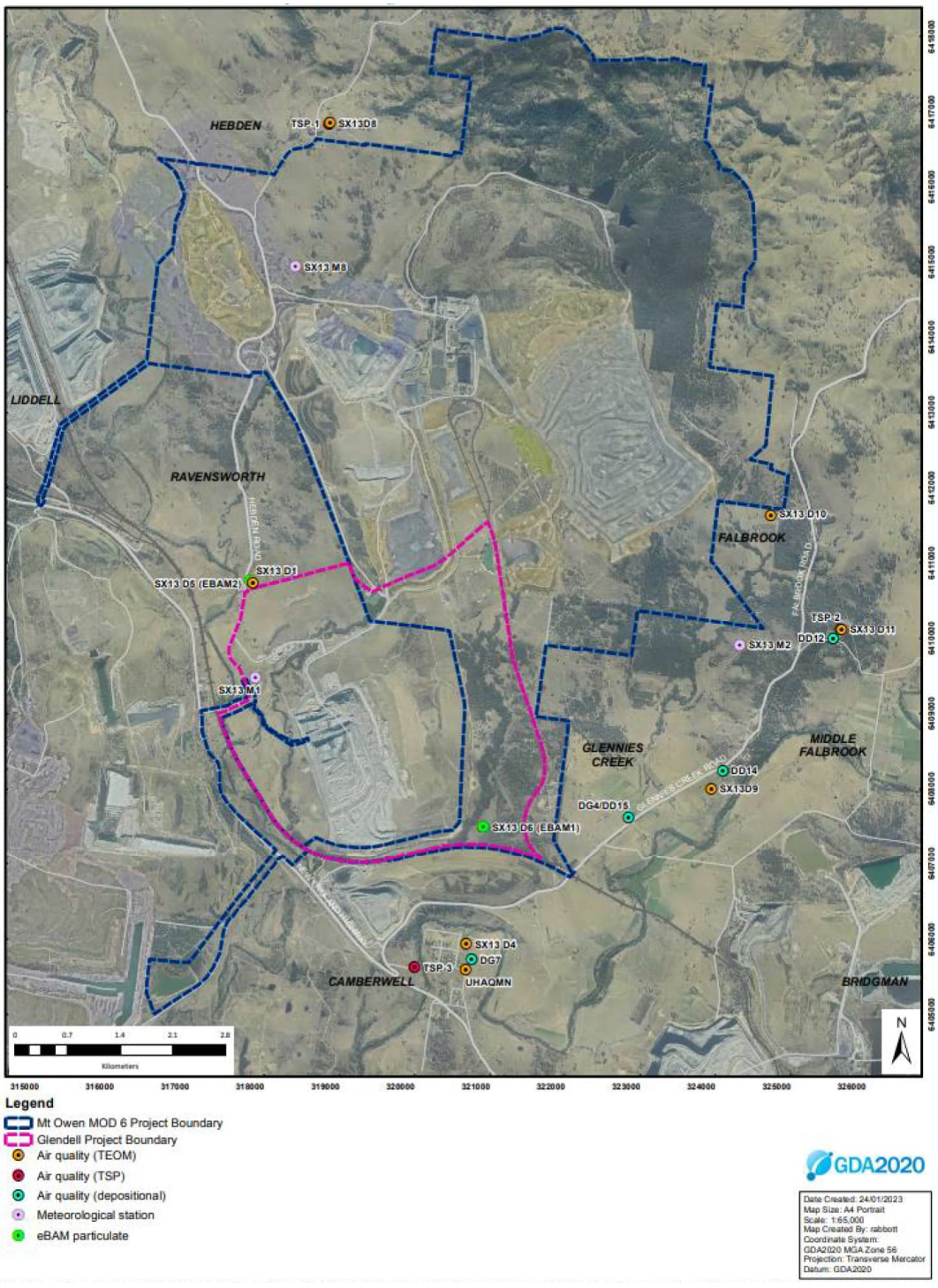


Figure 1 Location of air quality and meteorological monitoring sites

MOPL is required to report on compliance with the conditions of DA 80/952 in their Annual Reviews. DA 80/952 includes specific impact assessment criteria for air quality (Table 1) and compliance with these criteria is determined from analysis of the data collected at each of the monitoring sites shown in Figure 1 (with the exception of EBAM-1, EBAM-2 and Camberwell). Data from EBAM-1 and E-BAM-2 are used for operations management and not for measuring compliance. The Camberwell monitoring station is operated by the Department of Planning and Environment (DPE).

The MOPL Annual Reviews (see references) include all relevant air quality monitoring data for determining compliance with the impact assessment criteria from DA 80/952. The Annual Reviews from the most recent five years, 2018 to 2022 inclusive, have been reviewed. These reports indicate that Glendell has complied with its air quality conditions of DA 80/952 at all times. The 2018 result was influenced by bushfires and was classified as a "Low" risk level.

A detailed review of the existing air quality was also presented in the air quality assessment for the Mount Owen Continued Operations Modification 2 (Jacobs, 2018). This assessment identified PM_{10} as one of the key existing air quality issues, based on measured concentrations that have historically approached the assessment criteria noted by the EPA. The current assessment provides only a brief summary of the existing air quality conditions, focussing on annual average PM_{10} concentrations, as the main objective was to determine the potential change in air quality as a result of the Modification.

Figure 2 shows the spatial variation in annual average PM_{10} concentrations around the MOC for the eight year period from 2015 to 2022. The EPA impact assessment criterion was revised in 2017 from 30 to 25 $\mu g/m^3$. The results show that PM_{10} concentrations have complied with the 30 $\mu g/m^3$ criterion (DA 80/952) at all MOPL monitoring sites. Levels in Camberwell have typically been higher than at other locations with all locations generally recording higher levels in 2018 and 2019 due to the drought conditions that were experienced across many parts of NSW.

Figure 2 also includes the results from modelling for comparison with measured levels. This information shows that the modelling generally provided conservatively high estimates of air quality conditions, particularly around Glendell.

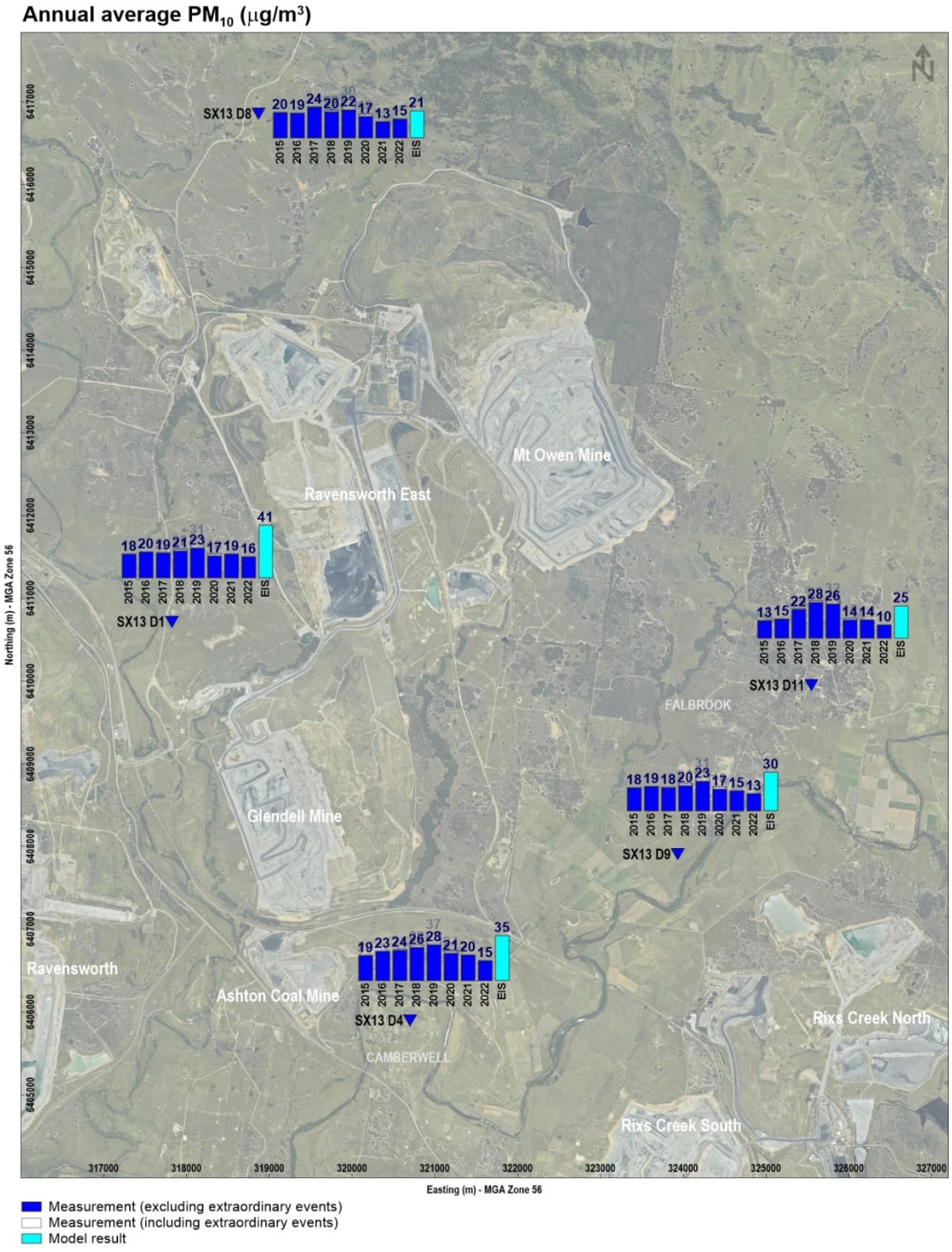


Figure 2 Spatial variation in annual average PM_{10} concentrations

5. Assessment of Impacts

5.1 Air Quality

The extent of air quality impacts due to the Approved Operation has been quantified most recently by Jacobs (2019) and is relied on for this Modification. As noted in Section 1 the Modification proposes only an extension to the period of mining by two years so the change in potential impacts could only result from changes to previous assumptions on other developments in the area which may influence cumulative interactions.

A review of other developments has been completed to determine whether the Modification will lead to an increased potential for cumulative air quality impacts, over the potential that is currently approved. Table 3 provides this discussion and potential effects.

Table 3 Potential air quality effects of other developments on the Modification

Development	Status	Discussion
Ashton Coal Underground (DA 309-11-2001-i) Ashton Coal Southeast Open Cut	Modification 11 was approved in 2022. Approved until end of 2035.	Ashton Coal Underground and Southeast Open Cut were both included in the modelling for MOD 4 (Jacobs, 2019). There will be no significant change to the location of mining at Ashton Coal Underground between 2023 and 2026. The Modification to allow Glendell to operate from July 2024 to June 2026 does not change approved extent of cumulative air quality impacts. The expected air quality impacts will be lower than forecast as the Southeast Open Cut Project has not progressed.
Hunter Valley Operations North (DA 450-10-2003) Hunter Valley Operations South (MP 06_0261)	Currently approved until end of 2025 (North) and end of 2030 (South). Maximum production of 22 Mtpa (North) and 20 Mtpa (South) ROM coal. The HVO Continuation Project (SSD-11826621) proposes a continuation of mining until end of 2050 (North) and end of 2045 (South). This application is currently under assessment by the consent authority.	The modelling for MOD 4 (Jacobs, 2019) considered all HVO sources of particulate matter within the model domain (Easting 310000 to 330000mE and 6400000 to 6420000mN) at the approved maximum production rates. In terms of the HVO Continuation Project: - There would be no change to the maximum production rate at HVO North. - The maximum production rate at HVO South would decrease from 20 Mtpa to 18 Mtpa. - Mining at HVO North would move closer to Glendell. - Mining at HVO South would move further from Glendell. - Mining at HVO South would operate in a reduced footprint. The modelling for MOD 4 indicated annual average PM_{10} concentrations in the order of 1 to 2 $\mu g/m^3$ in Camberwell due to HVO in 2023 (Jacobs, 2019). The modelling for the HVO Continuation Project indicated annual average PM_{10} concentrations in the order of 2 to 3 $\mu g/m^3$ in Camberwell due to HVO in 2025 (Jacobs, 2022). The potential change in contribution from HVO from 2023 to 2025 is due to HVO North moving in a southeast direction. However, the potential change in air quality (due to HVO in 2025) is not significant enough to change the potential cumulative impacts at the key sensitive receptor areas around Glendell.
Liddell Mine (DA 305-11-01)	Approved until end of 2028 but proceeding into closure from 2023 onwards.	Liddell was included in the modelling for MOD 4 (Jacobs, 2019). The closure of Liddell will lead to lower than anticipated cumulative air quality impacts. No increase in potential cumulative effects with the Modification over those previously assessed.
Mt Owen Mine (SSD-5850)	Approved until end of 2028. Mining operations moving in a southeasterly direction.	Mt Owen Mine MOD 2 was included in the modelling for MOD 4 (Jacobs, 2019). No increase in potential cumulative effects with the Modification over those previously assessed.
Ravensworth Mine (09_0176)	Approved until end of 2039. Mining operations moving in a southerly direction.	Ravensworth was included in the modelling for MOD 4 (Jacobs, 2019). No increase in potential cumulative effects with the Modification over those previously assessed.

Development	Status	Discussion
Rixs Creek North Mine (MP 08_0102)	Approved until end of 2035. An application has been lodged for the Rixs Creek North Continuation Project (SSD-60774228) but no assessment outcomes are available yet.	Rixs Creek North was included in the modelling for MOD 4 (Jacobs, 2019). The EIS for the Rix's Creek North Continuation Project is not yet available however it is unlikely that this project will be approved in the period relevant to the Modification, so there would be no expected increase in potential cumulative effects with the Modification over those previously assessed.
Rixs Creek South Mine (SSD 6300)	Approved until 12 October 2040.	Rixs Creek South was included in the modelling for MOD 4 (Jacobs, 2019). No increase in potential cumulative effects with the Modification over those previously assessed.

Table 3 shows that the most recent modelling for Glendell (MOD 4 as per Jacobs, 2019) considered all significant neighbouring operations and sources of particulate matter for the time period that is relevant to the Modification. Some changes in other operations have been noted:

- The Ashton Southeast Open Cut Project will not progress (as its project approval has been relinquished). This means by using the most recent (MOD 4) air quality modelling for the Modification its predicted cumulative impacts have been over-estimated.
- Liddell is now in a closure phase. Again, this means that using the most recent (MOD 4) air quality modelling for the Modification results in its predicted cumulative impacts being over-estimated.
- The HVO Continuation Project, if approved, will continue to contribute to air quality conditions in the key sensitive areas around Glendell however, these contributions do not impact on the air quality outcomes from the modelling undertaken in MOD 4.

From this information it has been concluded that the Modification (which affects timing) will not result in an increase in the currently approved cumulative air quality impacts due to changes in the timings of other developments in the area. There is no identified increase in potential cumulative effects with the Modification over those previously assessed.

5.2 Greenhouse Gas

The greenhouse gas inventory in this document has been calculated in accordance with the principles of the GHG Protocol and the "Technical Guidelines for the Estimation of Greenhouse Gas Emissions by Facilities in Australia" (DEE, 2017). The initial actions for a greenhouse gas inventory are to determine the sources of greenhouse gas emissions, assess their likely significance and set a boundary for the assessment. The purpose of the inventory is to provide updated estimates of emissions from Glendell that reflect the latest calculation methods, to inform State and National emission inventories.

The emissions are presented in terms of the "Scopes" to help understand the direct and indirect impacts of the project. The GHG Protocol (and similar reporting schemes) dictates that reporting Scope 1 and 2 sources is mandatory, whilst reporting Scope 3 sources is optional. Reporting significant Scope 3 sources is recommended. Scope 3 emissions are a consequence of the activities of the company, but from sources not owned or controlled by the company. Some examples of Scope 3 activities include the extraction and production of purchased materials, transportation of purchased fuels, and use of sold products and services. The inventory for this assessment includes all significant sources of greenhouse gases (Scopes 1, 2 and 3) associated with Glendell. Future projections of fuel usage and electricity were derived by pro-rata of usage reported under the National Greenhouse and Energy Reporting Scheme (NGERS) in FY21/22. Table 4 shows the key emission sources that have been considered in this assessment as well as the estimation methodologies.

It should be noted that the Modification only facilitates extraction of coal that is already approved for extraction. As such, the Modification will not increase the overall GHG emissions from Glendell. It is moving Glendell's emissions into the period from July 2024 to July 2026.

Table 4 Greenhouse gas emission sources and estimation methodologies

Activity	Description	Scope(s)	Emission estimation methodology
Diesel	Combustion of diesel fuel from on-site mobile and stationary plant and equipment	1, 3	Emission factors from NGA Factors (DCCEEW, 2023)
Electricity	Electricity usage	2, 3	Emission factors from the DCCEEW emission projections (DCCEEW, 2022)
Fugitive	Fugitive emissions from coal extraction	1	0.007 t CO_2-e / t ROM based on Glencore modelling
Transport (rail)	Transport of product coal from mine to port	3	DEFRA (2019) – freighting goods – freight train
Transport (shipping)	Transport of product coal from port to customers	3	DEFRA (2019) - freighting goods - Cargo ship, bulk carrier, average
Energy production	Use of product coal for energy production	3	Emission factors from NGA Factors (DCCEEW, 2023)

Table 5 shows the estimated emissions of greenhouse gases due to all relevant activities associated with Glendell. The direct emissions from Glendell (i.e. Scope 1) are estimated to range from 29,128 to 45,773 t CO_2-e per year. It should be noted that there are no specific criteria for which to assess the significance of projected greenhouse gas emissions from individual projects. The convention is to compare estimated emissions with national and state figures for consideration in achieving state, territory, or federal emission targets.

Table 5 Estimated greenhouse gas emissions

Activity	Usage	Emission factor (kg CO_2-e/unit)			Emission (t CO_2-e/y)			
		Scope 1	Scope 2	Scope 3	Scope 1	Scope 2	Scope 3	Total
FY 2025								
Diesel	8,944 kL	2709.72	0	667.78	24,237	0	5,973	30,210
Fugitive	700,000 t ROM	0.007	0	0	4,891	0	0	4,891
Electricity	361,599 kWh	0	0.49*	0.04	0	177	14	192
Rail	410,000 t	0	0	6.666	0	0	2,733	2,733
Shipping	410,000 t	0	0	28.312	0	0	11,608	11,608
Energy	410,000 t	0	0	2436.48	0	0	998,957	998,957
Total	-	-	-	-	29,128	177	1,019,285	1,048,590
FY 2026								
Diesel	14,056 kL	2709.72	0	667.78	38,087	0	9,386	47,473
Fugitive	1,100,000 t ROM	0.007	0	0	7,686	0	0	7,686
Electricity	568,227 kWh	0	0.39*	0.03	0	222	17	239
Rail	650,000 t	0	0	6.666	0	0	4,333	4,333
Shipping	650,000 t	0	0	28.312	0	0	18,403	18,403
Energy	650,000 t	0	0	2436.48	0	0	1,583,712	1,583,712
Total	-	-	-	-	45,773	222	1,615,851	1,661,845

* Scope 2 emissions estimates utilise grid greening assumptions consistent with DCCEEW (2022). The progressive reduction in emissions over time is an externality which is not in control of the project.

ROM coal extracted from Glendell is processed at the Mount Owen CHPP. Given that coal processing is undertaken pursuant to the Mount Owen Continued Operations (MOCO) Development Consent (SSD-5850), GHG emissions due to that activity are not attributed to the development under DA 80/952. Notwithstanding, Glendell and MOCO are

a single facility for the purposes of National Greenhouse and Energy Reporting Scheme (NGERS). Therefore, emissions due to processing of Glendell's coal are accounted for in the NGERS reporting for the entire MOC.

GHG emissions will also be generated by the mine closure phase, albeit at lower levels than during mining operations. The Modification will not materially alter the closure activities required at Glendell Mine. Therefore, GHG emissions associated with mine closure are not attributed to the Modification.

6. Conclusions

This report has provided an assessment of the potential air quality impacts and greenhouse gas emissions from the proposed Modification of the Glendell development consent to extend mining operations by an additional two years until the end of June 2026. Given that the Modification does not propose any enlargement or intensification of mining, the incremental impacts of Glendell will not vary from that of the Approved Operation. As such, this assessment has primarily focused on potential cumulative impacts due to mining operations extending into a new timeframe (i.e. July 2024 to June 2026). Greenhouse gas emissions have also been re-calculated for the new mining timeframe.

The assessment led to the following conclusions:

- The Modification does not involve any activity that will change the nature of air quality issues at Glendell, relative to the Approved Operation. The primary air quality issue will remain as particulate matter.
- Air quality conditions have historically been heavily influenced by climatic conditions including drought. Climatic variations will be relevant to the period applicable to the Modification.
- Glendell has complied with the air quality impact assessment criteria from DA 80/952 at all times in the eight-year period reviewed (2015 to 2022). An elevated result in 2018 was influenced by bushfires and classified as a "Low" risk level.
- The Modification (which affects timing) will not result in an increase in the currently approved cumulative air quality impacts due to changes in the timings of other developments in the area. There is no identified increase in potential cumulative effects with the Modification over those previously quantified and assessed.
- Direct emissions from Glendell (i.e. Scope 1) are estimated to range from 29,128 to 45,773 t CO_2-e per year, between 2025 and 2026. Such emissions would also have occurred as a result of the Approved Operations, except prior to June 2024.

The potential air quality impacts predicted by modelling will continue to be managed in accordance with relevant approval conditions and with the existing proactive and reactive management processes currently implemented at the MOC as outlined in the approved Mt Owen Glendell Operations Air Quality and Greenhouse Gas Management Plan.

7. References

DEE (2017) "Technical Guidelines for the Estimation of Greenhouse Gas Emissions by Facilities in Australia" Department of Environment and Energy.

DCCEEW (2022) "Australia's emissions projections 2022". Department of Climate Change, Energy, the Environment and Water. December 2022.

DCCEEW (2023) "National Greenhouse Accounts Factors August 2023". Department of Climate Change, Energy, the Environment and Water.

DEFRA (2019) "UK Government GHG Conversion Factors for Company Reporting".

EPA (2022) "Approved Methods for the Modelling and Assessment of Air Pollutants in NSW".

Jacobs (2019) "Glendell Mine Modification 4 – Air Quality Assessment". Prepared by Jacobs for Mt Owen Pty Ltd. Report dated 9 May 2019.

Jacobs (2022) "Hunter Valley Operations Continuation Project – Air Quality and Greenhouse Gas Assessment". Prepared by Jacobs for HV Operations Pty Ltd. Report dated 9 November 2022.

MOPL (2019) "Mt Owen Complex Annual Review 2018".

MOPL (2020) "Mt Owen Complex Annual Review 2019".

MOPL (2021) "Mt Owen Complex Annual Review 2020".

MOPL (2022) "Mt Owen Complex Annual Review 2021".

MOPL (2023) "Mt Owen Complex Annual Review 2022".

Umwelt (2007) "Environmental Assessment for Modification of Glendell Mine Operations". Prepared for Xstrata Coal by Umwelt (Australia) Pty Ltd, August 2007.

Umwelt (2019) "Greenhouse Gas and Energy Assessment – Glendell Continued Operations Project". Report dated November 2019.

APPENDIX B

NOISE IMPACT ASSESSMENT

Inspired People.
Dedicated Team.
Quality Outcomes.

Our Ref: 23983 Glendell MOD5 NIA_Final_20231220.docx

20 December 2023

Andrew Wu
Senior Environmental Engineer
James Baily & Associates

E| Andrew Wu <awu@baileyassociates.com.au>

Dear Andrew

RE: Noise Assessment in support of the Glendell MOD5 application

Umwelt's Acoustic Team is pleased to provide the following Noise Assessment in support of the Glendell MOD5 application. We understand Glencore Coal Assets Australia (GCAA) is seeking a two-year extension to the life of Glendell Mine. The proposed modification application (MOD5) to the Glendell Development Consent DA 80/952 will enable the mining of the currently approved mining area described by the MOD4 application and consolidated consent to be completed.

Proposed Project

Glendell Mine (Glendell) is a coal mining operation located approximately 20 km north-west of Singleton in the Upper Hunter region. Glendell is a component of the Mount Owen Complex (MOC), a mining precinct that also includes the Mount Owen and Ravensworth East Mines. The MOC is managed by Mt Owen Pty Limited (MOPL), which is a subsidiary of Glencore Coal Pty Limited.

Glendell operates under Development Consent DA 80/952 granted under the Environmental Planning and Assessment Act 1979. DA 80/952 enables mining operations to be carried out until the end of June 2024. MOPL is seeking a modification to DA 80/952 to extend mining operations by an additional two years until the end of June 2026 (the Modification).

The Modification is required to enable the completion of the approved mining under DA 80/952. There is approximately 1.8 Mt of run of mine (ROM) remaining within the mining area approved through MOD4. The Modification is required to facilitate extraction of the remaining coal reserves within the approved mining area.

The Modification will not alter any aspects of the approved development other than the period of mining operations. The Modification will not increase the approved disturbance boundary, production rate or total coal recovery under the Development Consent.

Umwelt (Australia) Pty Limited

ABN 18 059 519 041

T| 1300 793 267
E| info@umwelt.com.au

www.umwelt.com.au

Previous Noise Assessments

In 2007 Xstrata Mt Owen Pty Limited (XMO) applied to modify the Glendell Mine Development Consent (DA 80/952) to enable the integration of Glendell Mine operations with the approved Mt Owen Complex operations and to implement a revised mine plan. Advitech Pty Limited completed a Noise Impact Assessment (NIA) in support of this second modification to DA 80/952 (MOD2). The NIA included predicted noise impacts for five (5) conceptual mine plan stage years (Years 1.5, 3, 6, 9 and 12) for four (4) meteorological scenarios representative of weather conditions within the area surrounding Glendell Mine.

The physical layout of the Glendell Mine in the Year 12 noise model in the Advitech (2007) NIA is representative of the current stage of mining. The predicted noise levels in the Advitech (2007) NIA from the mining activities at Glendell at the nearest sensitive receivers range from less than 20 dB(A) up to 39 dB(A). The noise impacts were predicted to be highest in areas to the south to southeast of Glendell Mine during adverse weather conditions.

In 2018 Glencore applied to modify the Glendell Mine Development Consent (DA 80/952) (MOD4) to include an extension of the northern and western boundary of the approved Barrett Pit that covered an additional area of approximately 12 hectares (ha) and enabled access to an additional 2.5 Mt ROM coal. The noise assessment in the 2018 application reported the mining operations (with MOD4) would be able to achieve compliance with the existing DA 80/952 noise criteria at surrounding sensitive receivers.

It was noted in the 2018 application that the existing noise criteria would be achieved through the mining operations moving further away from sensitive receivers, the use of alternate haul locations depending on meteorological conditions along the western boundary of Glendell's Barrett Pit and through the continued implementation of the Mount Owen Complex Noise Management Plan.

Year 12 noise model

The Year 12 noise model of the Glendell Mine (Advitech, 2007) included the equipment and associated sound power level presented in **Table 1**. The total estimated operation sound power level during Year 12 of the mining operation was 127 dB(A). The list of fleet sound power levels in the 2007 NIA was not prescriptive, but indicative of the equipment that would be required to meet the noise limits at sensitive receiver locations.

Table 1 - Noise Source for Year 12 Noise Model (Advitech, 2007)

Table A4.6: Year 12 Sources [1]	Table A3.1: Indicative Fleet Specification Sound Power Level [2], dB(A)
1 EX 5500 EX01 Digging	117
2 EX 5500 EX02 Digging	117
3 EX 2500 EX03 Digging	114
4 CAT 793C Tr01 Idle	107
5 CAT 793 Tr02 Loaded up ramp	115
6 CAT 793 Tr03 Dumping	115
7 CAT 793 Tr04 Unloaded down ramp	115
8 CAT 793 Tr05 Idle	107
9 CAT 793 Tr06 Loaded up ramp	115

Table A4.6: Year 12 Sources [1]	Table A3.1: Indicative Fleet Specification Sound Power Level [2], dB(A)
10 CAT 793 Tr07 Dumping	115
11 CAT 789 Tc01 Idle	107
12 CAT 789 Tc02 Loaded up ramp	114
13 CAT 789 Tc03 Loaded haul road	114
14 CAT 789 Tc04 Unloaded on haul road	114
15 CAT 789 Tc05 Unloaded on haul road	114
16 D10 DOZER DZ01 Pushing	114
17 D10 DOZER DZ02 Pushing	114
18 D10 DOZER DZ03 Pushing	114
19 CAT 777 WC An02 Haul road maintenance	114
20 CAT 777 WC An04 Haul road maintenance	114
21 16H GRADER An01 Haul road maintenance	104
22 16H GRADER An03 Haul road maintenance	104
23 Drill An05 Drilling	114

Note: [1] Source: *Noise Impact Assessment Glendell Mine Modifications to Development Consent (NIA)*, Advitech Pty Limited 2007
[2] List of indicative fleet sound power levels in the 2007 NIA.

A summary of the maximum predicted Year 12 noise levels for Glendell Mine's receivers under adverse weather conditions is presented in **Table 2**.

Table 2 – Maximum Predicted Noise Levels for the Year 12 Noise Model (Advitech, 2007)

Receiver Location [1]	Predicted $L_{Aeq,15minite}$, dB(A)
21 – 23 Dulwich Place Camberwell	38
24 – 36 Lethbridge Street Camberwell	38
27 – 76 McInerney Road Camberwell	37
31 – 6 Dawson Street Camberwell	37

Note: [1] Source: *Noise Impact Assessment Glendell Mine Modifications to Development Consent*, Advitech Pty Limited 2007

Glendell MOD5 Intrusive $L_{Aeq,15minute}$ Noise Levels

Three operational scenarios have been considered for the activities that would be included in Glendell MOD5. These are: the site preparation and road construction; the drilling program; and the campaign mining (waste and coal). The equipment identified in **Table 1** and the associated sound power level have been used to establish noise models in **Table 3** representative of each scenario.

Table 3 – MOD 5 Noise Source Models

Noise Source [1]	Road Construction	Drilling Program	Campaign Mining	Combined Activities
1 EX 5500 EX01 Digging	-	-	✓	✓
2 EX 5500 EX02 Digging	-	-	-	-
3 EX 2500 EX03 Digging	✓	-	-	-
4 CAT 793C Tr01 Idle	-	-	✓	✓
5 CAT 793 Tr02 Loaded up ramp	-	-	✓	✓
6 CAT 793 Tr03 Dumping	-	-	✓	✓
7 CAT 793 Tr04 Unloaded down ramp	-	-	✓	✓
8 CAT 793 Tr05 Idle	-	-	-	-
9 CAT 793 Tr06 Loaded up ramp	-	-	-	-
10 CAT 793 Tr07 Dumping	-	-	-	-
11 CAT 789 Tc01 Idle	-	-	-	-
12 CAT 789 Tc02 Loaded up ramp	✓	-	-	-
13 CAT 789 Tc03 Loaded haul road	✓	-	-	✓
14 CAT 789 Tc04 Unloaded on haul road	✓	-	✓	✓
15 CAT 789 Tc05 Unloaded on haul road	-	-	✓	✓
16 D10 DOZER DZ01 Pushing	✓	-	✓	✓
17 D10 DOZER DZ02 Pushing	✓	-	✓	✓
18 D10 DOZER DZ03 Pushing	-	✓	-	-
19 CAT 777 WC An02 Haul road maintenance	-	-	✓	✓
20 CAT 777 WC An04 Haul road maintenance	✓	-	-	-
21 16H GRADER An01 Haul road maintenance	✓	-	✓	✓
22 16H GRADER An03 Haul road maintenance	-	-	-	-
23 Drill An05 Drilling	-	✓	-	✓

Note: [1] Source: *Noise Impact Assessment Glendell Mine Modifications to Development Consent*, Advitech Pty Limited 2007

The predicted intrusive $L_{Aeq,15minute}$ noise levels for the MOD5 mining activities at Glendell Mine's receivers under adverse weather conditions are presented in **Table 4**. This analysis of the predicted intrusive noise levels is based on the original predictions from the 2007 NIA Year 12 noise source models and the 2018 MOD 4 assessment.

Table 4 – Intrusive $L_{Aeq,15minute}$ Noise Levels for the MOD5 Noise Model Scenarios

Receiver Location	Road Construction	Drilling Program	Campaign Mining	Combined Activities
21 – 23 Dulwich Place Camberwell	33	28	35	36
24 – 36 Lethbridge Street Camberwell	33	28	35	36
27 – 76 McInerney Road Camberwell	32	27	34	35
31 – 6 Dawson Street Camberwell	32	27	34	35

As noted in the 2018 MOD4 application to extend the mining northern and western boundary of the approved pit shell, the proposed mining of the extension area is predicted to comply with the existing noise criteria.

Glendell MOD5 Contribution to the Cumulative $L_{Aeq,period}$ Noise Levels

The acoustic environment at receivers surrounding Glendell Mine includes contributions from other mining operations, road and rail traffic noise and rural activity in surrounding areas. To address potential cumulative noise impacts from existing and subsequent industrial developments, the 2000 EPA *Industrial Noise Policy* (INP) sets noise emission criteria with a view to maintaining noise levels below acceptable levels for residents. Under the INP the recommended amenity $L_{Aeq,period}$ noise levels (where period = day, evening and night) from industrial noise sources is 50 dB(A) day, 45 dB(A) evening and 40 dB(A) night.

The 2007 NIA in support of MOD2 adopted specific night time cumulative criteria for areas of Camberwell village. Cumulative criterion of 45 dB(A) was adopted for areas within a setback distance of 200 metres from the New England Highway and 42 dB(A) in the northern section of the village. The cumulative criteria do not exceed the INP's maximum acceptable Rural LAeq noise level.

The predicted contribution to the cumulative $L_{Aeq,period}$ industrial noise of the MOD5 mining activities at Glendell Mine under adverse weather conditions are presented in **Table 5**.

Table 5 – Contribution to the Cumulative $L_{Aeq,period}$ Noise Levels for the MOD5 Noise Model Scenarios

Receiver Location	Road Construction	Drilling Program	Campaign Mining	Combined Activities
21 – 23 Dulwich Place Camberwell	30	25	32	33
24 – 36 Lethbridge Street Camberwell	30	25	32	33
27 – 76 McInerney Road Camberwell	29	24	31	32
31 – 6 Dawson Street Camberwell	29	24	31	32

To assess cumulative $L_{Aeq,period}$ industrial noise levels the INP proposes a holistic approach where the total impact from all existing, proposed and potential industrial developments does not cause the acoustic amenity to deteriorate. The objective of this approach is to provide an equitable distribution of the burden of meeting the noise criteria based on nominated project-specific noise levels for each industrial development. The INP recognises that the effectiveness of this approach requires information on each existing or proposed operation, the commencement time and duration of each operation and how each operation fits within the landscape.

Previous cumulative noise impact assessments in the area have been qualitative rather than quantitative, with post approval monitoring used to validate the assessment and/or ensure compliance with statutory noise limits. The predicted contribution to the cumulative $L_{Aeq,period}$ industrial noise levels from the MOD5 mining activities at Glendell Mine presented in **Table 5** are 7 dB or more below the recommended amenity $L_{Aeq,period}$ noise levels. This suggests the contribution of the MOD5 mining activities at Glendell Mine to the cumulative $L_{Aeq,period}$ industrial noise levels will not be significant.

An alternative assessment process is provided in the NSW *Noise Policy for Industry* (NPfI). The policy addresses the assessment of cumulative noise by establishing project amenity noise limits for each industrial noise source independent of any other industrial noise source. The project amenity noise level is

calculated as the recommended amenity noise level for a locality minus 5 dB(A). The NPfI recommended amenity noise levels in the NPfI are the same as the recommended amenity $L_{Aeq,period}$ noise levels from industrial noise sources in the INP (i.e. 50 dB(A) day, 45 dB(A) evening and 40 dB(A) night).

The method described above does not account for specific nighttime cumulative criteria that were adopted for areas of Camberwell village. This would need to be assessed in accordance with Section 2.4.1 of the NPfI, which addresses amenity noise levels in areas of high traffic noise. However, the core pathway of the NPfI aims to maintain the total industrial noise level from all sources at or below the recommended amenity noise level through the implementation of feasible and reasonable controls. Therefore, the $L_{Aeq,period}$ project amenity noise levels in Camberwell for an individual industrial operation under the NPfI would be 45 dB(A) day, 40 dB(A) evening and 35 dB(A) night.

Having established project amenity $L_{Aeq,period}$ noise levels for an industrial operation, the Section 2.4 of the NPfI states "where the project amenity noise level applies and it can be met, no additional consideration of cumulative industrial noise is required".

The predicted $L_{Aeq,period}$ noise levels from the MOD5 mining activities at Glendell mine under adverse weather conditions presented in **Table 5** are less than the $L_{Aeq,period}$ project amenity noise levels required by the NPfI. If the pathway provided by the NPfI was adopted, then no additional consideration of cumulative industrial noise would be required.

Conclusion

This noise impact assessment has considered both the intrusive noise levels from the MOD5 mining activities at Glendell mine and the contribution the mining activities would have on the amenity noise levels in the region surrounding the mine.

It has been determined that the mining activities in the northern and western boundary of the approved pit shell would achieve the existing intrusive $L_{Aeq,period}$ noise limits.

The predicted contribution to the cumulative $L_{Aeq,period}$ industrial noise levels from the MOD5 mining activities are 7 dB or more below the INP's recommended amenity $L_{Aeq,period}$ noise levels. Additionally, the $L_{Aeq,period}$ noise levels from the MOD5 mining activities are below the NPfI's project amenity $L_{Aeq,period}$ noise levels.

Given that the Modification does not propose any enlargement or intensification of mining, the noise impacts from Glendell mine will satisfy the requirements of the INP and the cumulative noise assessment pathway of the NPfI. Notwithstanding this, it is recommended the currently approved statutory noise limits and noise monitoring program should be maintained during the extension to the life-of-mine under MOD 5.

Yours sincerely

Tim Procter
Practice Lead – Acoustic Environment
E | tprocter@umwelt.com.au
M| 0438 007 971