Bulli Seam Operations Project Modification 3
Appin Mine Ventilation and Access

State Significant Development Modification Assessment (08_0150 MOD 3)

Planning Secretary's Assessment Report

April 2022

Published by the NSW Department of Planning, Industry and Environment

dpi.e.nsw.gov.au

Title: Bulli Seam Operations Project: Modification 3

Subtitle: Appin Mine Ventilation and Access

Cover image: Photo of proposed Appin Mine Ventilation and Access site taken from the property located at 30 Finns Road, Menangle facing due east.

Executive Summary

Background

The Bulli Seam Operations Project (BSOP) is a mining complex comprising the Appin Mine and West Cliff Colliery, two existing underground coal mines located approximately 25 kilometres (km) northwest of Wollongong.

The current BSOP approval was granted in 2011 and allows:

- extraction of up to 10.5 million tonnes per annum (Mtpa) of Run of Mine (ROM) coal using longwall mining methods until 2041;
- operation of a range of ancillary mining and mine ventilation facilities at the Appin Mine and West Cliff Colliery pit top sites;
- processing of coal at the West Cliff Coal Handling and Preparation Plant;
- operation of a mine gas drainage system at the Appin Mine pit top;
- transportation of coal by road to Port Kembla for export; and
- transportation and emplacement of coal rejects at the West Cliff Emplacement Area.

Proposed Modification

The proposed modification involves the development of an additional mine ventilation and access site at 345 Menangle Road, Menangle, including the construction and operation of:

- one downcast ventilation shaft (VS7) including mine access facilities;
- one upcast ventilation shaft (VS8);
- ancillary facilities and amenities including storage areas, bathhouses, offices and car parks;
- an upgraded site access intersection with Menangle Road; and
- services and associated infrastructure for the provision of water, power, sewerage treatment and communication.

The proposed modification would not change the mine life, mining method, production rate, coal transportation arrangements or hours of operation.

Public Engagement and Consultation

The Department publicly exhibited the Modification Report from 21 July 2021 until 3 August 2021 and notified previous submitters. The Department received two submissions from special interest groups (one in support and one commenting) and 15 submissions from members of the general public (two in support, two commenting and 11 objecting). All objecting submissions were from local residents. The Department also received advice from nine government agencies including Wollondilly Shire Council (Council).

Assessment

The Department acknowledges that the proposed ventilation and access site is within an area that has not previously been subject to mining ancillary operations and is essentially a “greenfield site” in relation to impacts on sensitive receivers, such as rural residential properties in the area.

Therefore, the Department considers that the key assessment issues for the modification are related to amenity issues including noise, blasting, air quality and visual impacts, along with traffic impacts. A summary of the Department’s consideration of the key assessment issues is outlined below

Noise

The proposed duration of construction activities would be around three years. The applicant has committed to implement all reasonable and feasible noise mitigation and management measures to reduce noise. In particular, these include restricting all construction activities to the day time period until acoustic sheds or alternative noise mitigation are constructed over the ventilation shaft construction

areas. In particular, these include restricting all construction activities to the day time period until acoustic sheds are constructed over the ventilation shaft construction areas. Following the installation of the acoustic sheds, the applicant proposes to operate out of standard construction hours for ventilation shaft sinking activities. Construction of acoustic barriers and enclosures around fans and scrubbers are also proposed.

During the initial site establishment construction stage, including construction of the access intersection into the site and civil works, noise levels of between 1-5 dB(A) above the day time noise construction limits are predicted at two receivers. The Department considers these would be acceptable as the exceedances are restricted to standard construction hours and they would be for a limited duration (in the order of 7 months).

However, to ensure the amenity of the nearest sensitive receivers during the 3 year construction period, the Department has recommended that when shaft sinking activities are being undertaken, along with other surface construction activities following site establishment, stricter noise criteria be applied in accordance with noise criteria set in *NSW Noise Policy for Industry 2017* (NPfI).

During the remainder of the construction period, the predicted noise levels would comply with the noise criteria in the NPfI at all nearby sensitive receivers. During the operation of the site, predicted noise levels would also be below the NPfI noise criteria.

The Department has also recommended conditions requiring the applicant to operate a real-time monitoring and pro-active noise management regime at the site during construction and operations.

Blasting

Construction of the ventilation shafts would require the use of small explosive blasting charges to break up hard rock, such as sandstone, into removable pieces. Up to one construction blast per shaft, per 24 hour period is proposed (i.e. two blasts per 24 hour period at the site).

The blast assessment demonstrates that, with the implementation of a range of blast design controls and mitigation measures (blast mats, water curtains and sheds), compliance with applicable criteria for both vibration and overpressure can be achieved during day time shaft construction activities.

However, there are currently no Australian guidelines or policy for vibration or overpressure from blasts undertaken during evening or night time periods, and approval for blasting activities that lead to blast overpressure at receivers at these times is extremely rare and typically not permitted in NSW.

The Department accepts that the proposed construction blasting would occur at increasing depth as the shaft construction progresses towards the underground mine. As the shafts are sequentially excavated towards their final depths (approximately 591 m for VS7 and 560 m for VS8) the blast impacts at sensitive receivers would reduce.

Therefore, the Department has recommended that blasting be restricted to standard hours until it can be demonstrated that compliance with strict sleep disturbance criteria in the NPfI can be achieved. Any out of hours blasting proposed would require subsequent approval of the Planning Secretary. The Department acknowledges that this may extend the construction period by a few months, however considers this is necessary in order to preserve the amenity of surrounding residences.

The Department has recommended the preparation and implementation of a site specific Blast Management Plan, together with a detailed monitoring program for evaluating and reporting on compliance with the blast criteria.

Air Quality

An independent air quality expert was engaged by the Department to provide advice on the adequacy of the air quality assessment prepared for the modification. The advice confirmed that the potential air quality impacts associated with the modification, including off-site odour, fume and dust emissions would comply with the relevant criteria and are unlikely to result in unacceptable amenity or health issues to the surrounding residences.

The Department has recommended that a site specific air quality monitoring and management plan be prepared for the ventilation and access site, which includes an odour management plan and gaseous emissions monitoring program, as well as a real-time air quality management system.

Traffic

The modification involves the construction and operation of a new intersection between the site entrance and Menangle Road. The Department has recommended that the intersection be designed to the satisfaction of Council and Transport for NSW.

The Department accepts that the predicted increase in traffic associated with both the construction and operation of the site are relatively minor (maximum of 9.6% increase along Menangle Road south during operations) and are at levels that would allow intersections and local/regional roads to operate at an acceptable level of performance without compromising road safety.

Visual Impacts

The visual assessment indicates that two residential receivers with direct views to the site would experience moderate to high adverse visual impacts in the short to medium term. The establishment of visual bunds at the site and planting of screening vegetation along the site boundary and at the impacted residences would filter and shield the views of the site in the longer term.

Other

The modification is not likely to significantly change the impacts of the BSOP on biodiversity, water resources, heritage values, social or greenhouse gases beyond those which are already approved.

The Department considers that the existing conditions of consent are largely adequate to manage these impacts, although it has recommended a number of changes to contemporise the conditions, including requiring the Surface Water Management Plan to include trigger levels for investigating potentially adverse impacts on water resources or water quality, management plans for the proposed on-site sewage system, and updating the rehabilitation conditions to align with recent statutory requirements. An additional biodiversity condition has been recommended to offset a small area of native vegetation that would be cleared.

Evaluation

The Department recognises that the modification proposal is necessary to provide the required ventilation infrastructure and mine access to ensure a safe and efficient underground working environment and support the ongoing operation of the mine. Further, the development of the mine access facility would reduce underground travel times and therefore improve production efficiency.

However, the Department acknowledges that there would be an increase in amenity impacts in the local area, particularly at the two closest receivers from increased noise and visual impacts. The Department has carefully considered these residual impacts on these receivers against relevant NSW government policy and guidelines, and recommended conditions to ensure these impacts are minimised as far as reasonable and feasible.

Strategically, the Department recognises that ongoing operation of the mine would ensure continued supply of high-quality metallurgical coking coal to Australian steelmakers, as well as the continued direct employment of 1,800 people, continued engagement of local suppliers and businesses (A$237M spent in 2020) and provision of substantial royalties (A$2 billion) to the State.

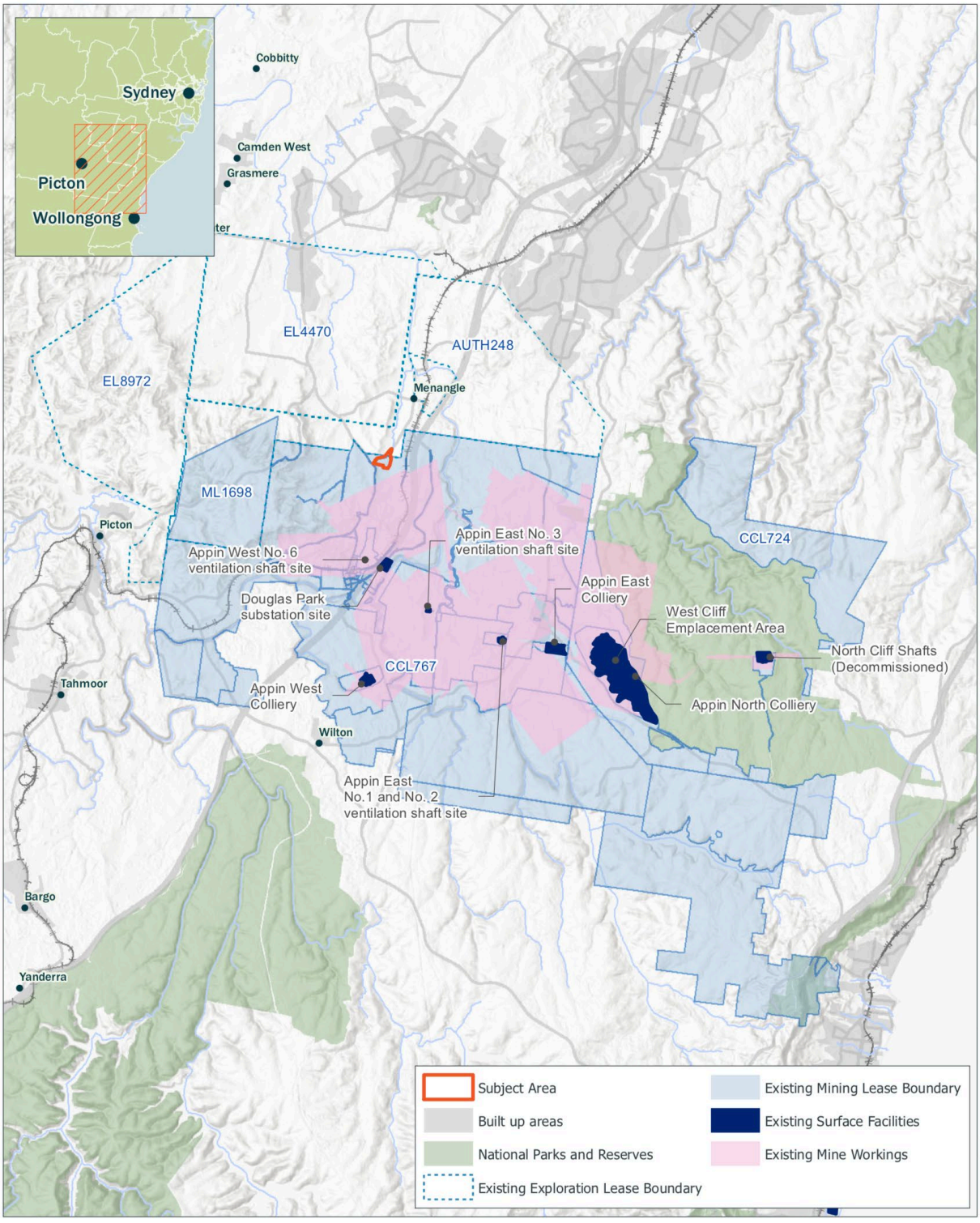
On balance, the Department is satisfied that the proposed modification can be carried out in an environmentally sustainable manner, and that the proposal is in the public interest as it would allow the continued operation of the mine and the associated employment and economic benefits to be realised. Accordingly, the Department considers that the modification can be approved.

Contents

1 Introduction

1.1 Background

The Bulli Seam Operations Project (BSOP) is a mining complex comprising the Appin Mine and West Cliff Colliery, two existing underground coal mines located approximately 25 kilometres (km) northwest of Wollongong (see **Figure 1**).



Appin Mine (the mine) has been operating since the 1960s. It is currently owned and operated by Endeavour Coal Pty Ltd (the applicant), a subsidiary of Illawarra Coal Holdings Pty Ltd, which is a subsidiary of South32 Illawarra Metallurgical Coal (IMC).

The mine supplies metallurgical coal to Australian steelmakers, including BlueScope Port Kembla Steelworks, which is the largest steel production facility in the country. The mine is also a significant employer in the region, directly employing around 1,800 people and supporting a large indirect workforce.

1.2 Current Approval

The project approval for the BSOP was granted by the Planning Assessment Commission (now the Independent Planning Commission of NSW) on 22 December 2011. In summary, the approval allows:

- extraction of up to 10.5 million tonnes per annum (Mtpa) of run of mine (ROM) coal from the Appin and West Cliff underground mining domains, using longwall mining methods until 2041;
- operation of a range of ancillary mining and mine ventilation facilities at the Appin Mine and West Cliff Colliery pit top sites;
- processing of coal at the West Cliff Coal Handling and Preparation Plant (CHPP);
- operation of a mine gas drainage system at the Appin Mine pit top;
- transportation of up to 9.3 Mtpa of ROM coal by road to Port Kembla for export and to domestic customers; and
- transportation and emplacement of coal rejects at the West Cliff Emplacement Area.

As summarised in **Table 1**, the Department has subsequently approved two modifications of the project approval.

Table 1 | Summary of modifications

Mod No.	Summary of Modification	Approval Date
MOD 1	• Provision of combined strategic biodiversity offsets to meet current and future biodiversity offsetting requirements for the BSOP and the Dendrobium Coal Mine	2 April 2015
MOD 2	• Construction and operation of a 4 km mine gas drainage pipeline between the Appin No. 2 and Appin No. 3 ventilation shafts, including ancillary infrastructure • Regulation of the Ventilation Shaft 6 (VS6) operations under the BSOP approval • Administrative amendments	28 October 2016

2 Proposed Modification

2.1 Scope of Modification

The modification application and associated Modification Report (see **Appendix A1**) was lodged under section 4.55(2) of the EP&A Act. The proposed modification involves the development of mine ventilation and mine access infrastructure to support the existing ongoing operations of the Mine, and administrative amendments to the existing project approval.

Mine Ventilation and Access

The proposed mine ventilation and access site would be located at 345 Menangle Road, Menangle, directly above the approved main underground mine roadway workings associated with Appin Area 7, and within the South Campbelltown Mine Subsidence District. The regional site location and proposed site layout are shown in **Figures 2** and **3**, respectively.

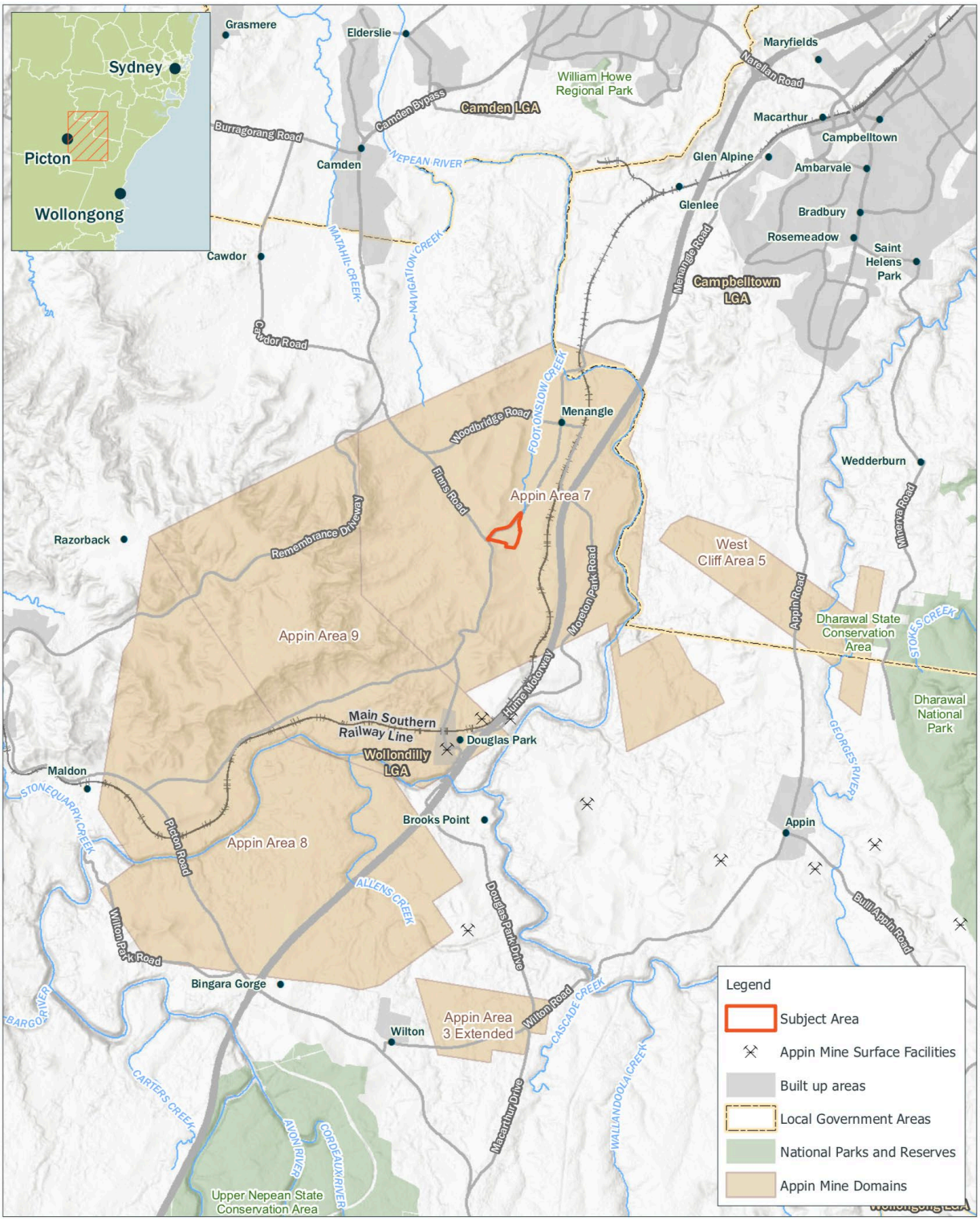


Figure 2 | Mine Ventilation and Access Site Location

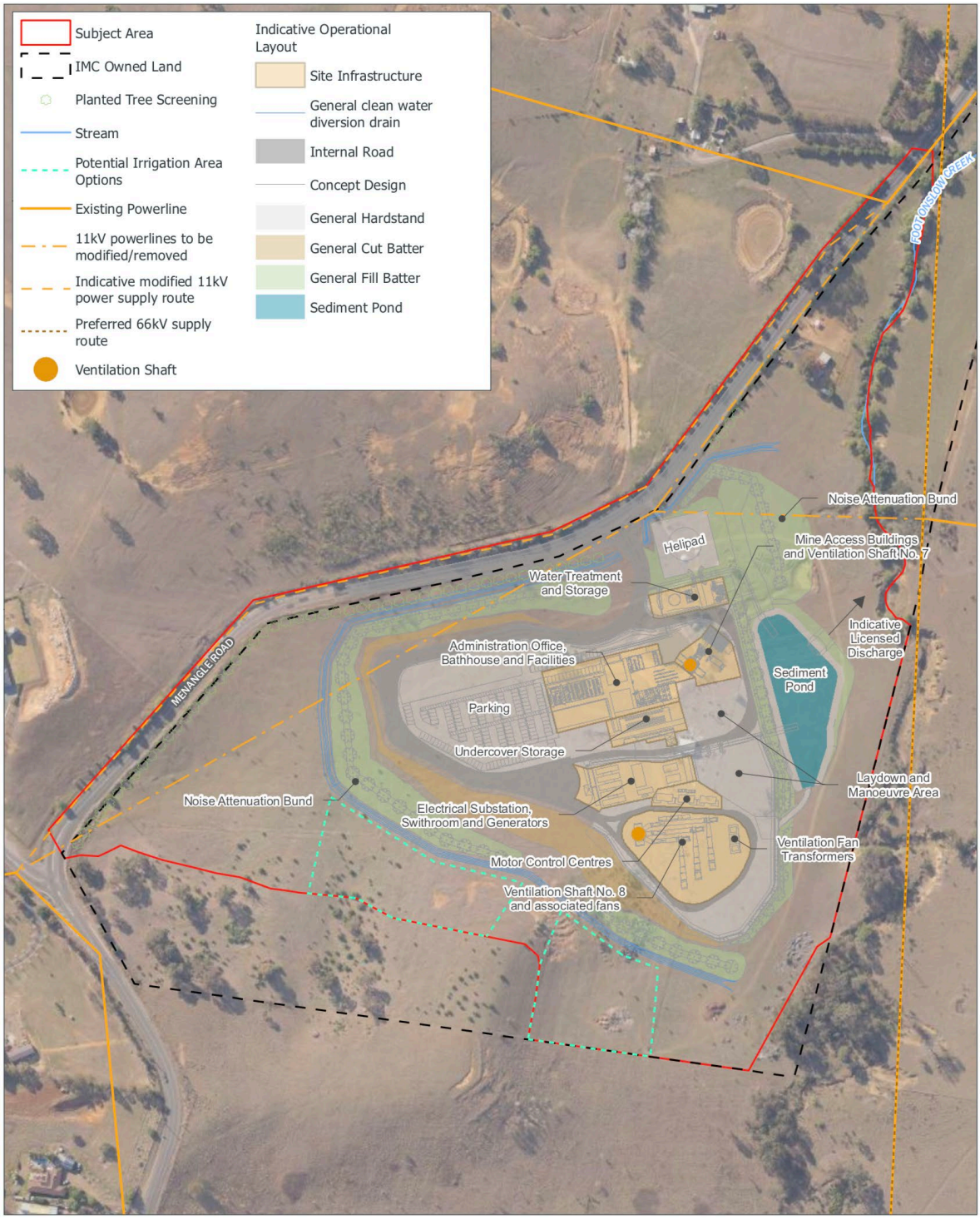


Figure 3 | Proposed Ventilation and Access Modification Site Layout

Establishment of the mine ventilation and access site would involve the construction and operation of:

- one downcast ventilation shaft (VS7) (591 m deep and ~8.1 m diameter);
- one upcast ventilation shaft (VS8) (560 m deep and ~6.1 m diameter);
- associated extraction fans (3), evases (diffusers), generators, housing and ducts for VS8
- mine access facilities (i.e. head frame and winder) and evases within VS7;
- ancillary facilities and amenities including storage areas, bathhouses, offices and car parks;
- an upgraded site access intersection with Menangle Road; and
- services and associated infrastructure for the provision of water, power, sewage treatment and communication.

Conventional shaft sinking involving mechanical excavation and controlled blasting is proposed. When compared to blind boring techniques (i.e. vertical large diameter drilling), this shaft construction method is considered to provide greater control over varied geological conditions and reduced impacts on the community as it requires short blasts rather than constant drilling and would require an overall shorter construction duration.

Site establishment and construction activities, including shaft sinking and lining works and the construction of mine access infrastructure, are scheduled to take up to three years. Based on the current mining schedule, to maintain continuity of safe underground mining operations the proposed ventilation shafts are required to be operational on or before 2025.

The modification would not change the mine life, mining method, production rates, coal transportation arrangements, or hours of operation. A summary of the proposed modification compared to the approved project is provided in **Table 2**. The proposal is described in detail in the Modification Report (see **Appendix A1**).

Table 2 | Comparison of Proposed Modification and Approved Project

Component	Approved Project	Proposed Modification
Mine life	• Until 31 December 2041	• No change
Mining and Reserves	• Longwall mining method • Reserves of 306 Mt of ROM coal	• No change
Production Rate	• Up to 10.5 Mtpa ROM coal	• No change
Hours of operation	• 24 hours a day, 7 days a week	• No change
Processing and Transport	• Processed at the West Cliff CHPP • Transport by road to Port Kembla Coal Terminal and domestic customers	• No change
Mine Ventilation	• Appin East No. 1, 2 and 3 ventilation shaft sites • Appin West No. 6 ventilation shaft site	• Proposed new VS7 and VS8 ventilation shaft site
Access to Underground Workings	• Appin West (Access Shaft) • Appin East (Access Drift) • Appin North (Access Drift)	• Addition of mine access and infrastructure (head frame and winder) within VC7 (Access Shaft)
Surface Infrastructure	• Upgrade and utilisation of existing pit top facilities at West Cliff, Appin East and Appin West • Upgrade of existing and construction of additional remote services sites for ventilation, bores, power, communication and monitoring	• No change to existing pit top or remote service facilities • New remote services ventilation shaft site at 345 Menangle Road, Menangle, including access road, ventilation shafts, storage areas, bathhouses, offices, car park and associated facilities
Water Supply	• Potable water supply purchased from Sydney Water • Mine water sourced from groundwater bores, old underground workings and surface water runoff from mine operational areas	• No change to water supply for existing mine facilities • Water supply for new ventilation shaft site to be sourced by water carts during construction. Permanent operational water supply proposed via an extension of Sydney Water's Menangle water supply network, following required water mains network upgrades.
Electrical Supply	• Douglas Park Substation site	• During construction - via augmentation of the existing 11 kilovolt (kV) powerline along Menangle Road • During Operation – via an external 66 kV powerline (location and specifications to be confirmed during detailed design), switchyard and substation • Backup diesel power generation during both construction and operational phases

Component	Approved Project	Proposed Modification
Biodiversity offsets and Rehabilitation	• Appin East Mine Gas Drainage Project biodiversity offset, including retirement of 4 equivalent biodiversity credits for the clearing of 0.45 ha of Cumberland Plain Woodland • Ventilation Shaft No. 6 biodiversity offset comprising 8.7 ha of Cumberland Plain Woodland vegetation • Progressive rehabilitation of the site	• No change to existing offsets or progressive rehabilitation of areas disturbed by the project • Two (2) additional ecosystem offset credits required for the clearing of small patches of Cumberland Plain Endangered Ecological Communities (EECs) PCT 835 (0.44 ha) and highly modified PCT 849 (18.34 ha).
Employment	• 1,800 employees	• 74 additional employees during construction • 308 employees during operation (majority existing)

Administrative Amendments to the Project Approval

The applicant is also seeking approval to amend several current conditions of the project approval. As discussed in detail in Section 5.6, the proposed amendments are generally administrative and include correcting references and contemporising certain conditions of approval.

2.2 Justification for the Modification

The applicant contends that the modification would provide the required ventilation infrastructure and mine access to ensure a safe and efficient underground working environment to support the ongoing operation of the mine. More specifically, mine ventilation is required to:

- provide air of sufficient quantity and quality for a safe working environment;
- dilute mine gases to below prescribed concentrations; and
- cool the working areas for comfort and mitigation of heat stress.

Mine access from the site would reduce underground travel times and therefore improve production efficiency. Other benefits of the mine access facility include improved safety through reduced egress times in the event of an incident, and reduced logistics complexity with timely delivery of consumables and other key underground components.

The applicant has also noted that co-locating the ventilation and mine access infrastructure on the same site would reduce the overall development footprint compared with two facilities at separate sites.

It is important to note that the original assessment documentation for the BSOP specifically contemplated the need to develop future mine ventilation and mine access facilities to maintain a safe working environment within the underground mine. Adequate ventilation infrastructure and mine access facilities are an integral part of underground mining to ensure a safe and efficient underground working environment.

3 Strategic Context

3.1 Southern coalfields

The BSOP is located in the Southern Coalfields of NSW. The Southern Coalfield is one of the five major coalfields located within the Sydney-Gunnedah Basin. It is located south of Sydney and to the west of Wollongong with topography that is defined by the Illawarra and Woronora Plateau.

The Southern Coalfield has a long history of coal exploration and mining, with underground mining being undertaken in the area for over 200 years. In addition to the BSOP, there are seven nearby mining operations which are in various phases of operation or care and maintenance, or have recently closed. These are:

- Dendrobium Colliery (Illawarra Coal Holdings Pty Ltd) – operating;

- Russell Vale Colliery (Wollongong Coal Ltd) – operating;
- North Cliff Colliery (Illawarra Coal Holdings Pty Ltd) – not operating;
- Metropolitan Colliery (Helensburgh Coal Pty Ltd) – operating;
- Wongawilli Colliery (Wollongong Coal Ltd) – currently under care and maintenance but seeking modification to allow recommencement of mining using first workings only;
- Tahmoor Mine (Tahmoor Coal Pty Ltd) – operating; and
- Berrima (Medway) Colliery (Boral Cement Pty Ltd) – under care and maintenance and closure

The Southern Coalfield has historically been a major source of high-quality hard coking coal used for steel making, both in Australia and internationally.

3.2 Land use around the site

The proposed site is located in a rural area on the southern margins of the Cumberland Plain, which is characterised by low lying, gently undulating plains and hills. The site slopes from the south-west to a low area near Foot Onslow Creek and is mostly cleared of vegetation other than grass. The wider area is characterised by mostly cleared hills used for grazing to the east and small rural holdings on predominantly cleared hills to the north, west and south.

The site is located approximately 8 km northwest of Appin and 1.3 km southwest of the village of Menangle. The western extent of the site is bound by Menangle Road and the eastern side by Foot Onslow Creek. The Hume Highway is approximately 670 metres (m) to the east of the site.

Adjacent land uses include stock grazing, rural residential and mixed agriculture, with the nearest residential receiver located approximately 415 m to the north of the nearest proposed ventilation shaft.

4 Statutory Context

4.1 Transition to State Significant Development

The BSOP was approved under the former Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) in December 2011.

Under clause 6 of Schedule 2 of the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, the project was transitioned to State Significant Development (SSD) by order, which took effect by publication in the NSW Government Gazette on 23 November 2018.

4.2 Scope of Modification

The modification application and Modification Report were lodged under Section 4.55(2) of the EP&A Act. The Department has reviewed the scope of the modification and considers that:

- the proposed changes are relatively minor in comparison to the approved project, and are required to support the existing approved mining operations. However, the Department acknowledges that there would be more substantial impacts from the proposed ventilation shaft site as there has been no mine infrastructure in this area before;
- there would be no change to the approved mine life, mining methods, production rates, coal transportation arrangements or hours of operation;
- the operational impacts of the development as modified would be similar to the impacts of the approved project (see Section 6); and
- the development would remain substantially the same development as originally approved.

Therefore, the Department is satisfied the proposed modification is within the scope of section 4.55(2) of the EP&A Act and does not constitute a new development application. Accordingly, the Department considers that the application should be assessed and determined under section 4.55(2) of the Act.

The Department also considered:

- advice provided concerning the proposed modification (see Section 5); and
- the relevant matters in Section 4.15(1) of the EP&A Act, including:
    - the provisions of relevant environmental planning instruments (see Section 4.4);
    - the likely impacts of the proposed modification, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality (see Section 6);
    - the public interest, including any relevant objects of the EP&A Act (see Section 4.5); and
    - the reasons given by the approval authority for the grant of the original approval (see Section 4.4).

4.3 Consent Authority

The Minister for Planning (Minister) is the consent authority for the modification application under Section 4.5(a) of the EP&A Act. However, under the Minister's delegation of the 9 March 2022, the Director Resource Assessments may determine the application because there were fewer than 15 public submissions by way of objection, Wollondilly Shire Council (Council) did not object to the proposal and the applicant did not make any political donations.

4.4 Mandatory Matters for Consideration

In accordance with Section 4.55(3) and Section 4.15(1) of the EP&A Act, a consent authority must consider the following matters, to the extent they are relevant, when considering the merits of the application:

- environmental planning instruments, draft instruments, and any planning agreements;
- the EP&A Regulation;
- likely impacts of the modification application, including environmental impacts on both the natural and built environments, and social and economic impacts;
- the suitability of the site;
- any submissions;
- the public interest; and
- the reasons for granting approval for the original application.

The Department has considered all these matters carefully and summarised the findings of this below and in Sections 4 and 5 of this report.

Environmental Planning Instruments

Several environmental planning instruments apply to the modification, including:

- *State Environmental Planning Policy (Mining Petroleum Production and Extractive Industries) 2007* (the Mining SEPP);
- *State Environmental Planning Policy (Infrastructure) 2007*;
- *State Environmental Planning Policy (State and Regional Development) 2011* (RTSD SEPP);
- *State Environmental Planning Policy 33 (SEPP No. 33) – Hazardous and Offensive Development*;
- *Sydney Regional Environmental Plan No*. 20 – *Hawkesbury Nepean River*; and
- *Wollondilly Local Environmental Plan 2011*.

The Department has considered the proposed modification against the relevant provisions of these instruments. The Department considers that the proposed modification can be undertaken in a manner that is generally in accordance with the aims, objectives and provisions of these instruments.

Reasons for Original Approval

In determining the original BSOP application, the Planning Assessment Commission concluded that the benefits of the project outweighed the residual environmental impacts and imposed a range of strict conditions to appropriately manage the impacts. The Department has considered the proposed modification against the reasons the Planning Assessment Commission gave for determining the

project and is satisfied that the proposed modification does not affect the decision that was previously made. The proposed modification would allow similar benefits to be realised at local, regional and State levels.

4.5 Objects of the EP&A Act

The objects of the EP&A Act are the underpinning principles for all decision making under the Act. They must be considered by the consent authority when determining a development application under the Act. The Department has assessed the project against the objects found in section 1.3 of the EP&A Act. **Appendix B** summarises how the Department considers that the project can be undertaken in a manner that is consistent with these objectives, including Ecologically Sustainable Development (ESD).

5 Engagement

5.1 Public Engagement and Consultation

The Department publicly exhibited the Modification Report on the Department's website from 21 July 2021 until 3 August 2021 and previous submitters and landowners adjacent to the site were notified and invited to make a submission. The modification application was also referred to Council and relevant State government agencies for advice.

The Department received 17 submissions comprising two from special interest groups (one in support and one commenting) and 15 from members of the general public (two in support, two commenting and 11 objecting). All objecting submissions were from local residents.

The Department also received advice from nine government agencies, including Council.

A summary of submissions and agency advice is provided below. Full copies of the submissions and advice are available on the Department's website (see **Appendix A2** and **A3)**.

Following the formal exhibition period, the Department continued to accept representations from the community on the modification. . Several representations were received via the Office of Mr Nathaniel Smith MP, Member for Wollondilly. The representations all objected to the modification.

The applicant provided a Submissions Report and additional information responding to the issues raised in submissions and advice provided by the agencies (see **Appendix A4**).

5.2 Key Issues - Special Interest Group and Community

The key issues raised in public submissions that supported the proposed modification considered that it would continue to:

- allow sustainable ongoing operation of the mine;
- provide direct and indirect employment for the Illawarra region;
- allow metallurgical coal mining to support steel making at Port Kembla; and
- provide economic benefits for small local businesses.

One submission in support of the modification noted the applicant's strong track record of operating with integrity and with consideration of the community.

The key issues raised in the public and special interest group submissions that objected to the proposed modification related to:

- traffic impacts associated with heavy vehicles and project traffic on the local road network;
- negative impacts on existing views from adjacent residential homes and the surrounding landscape;
- negative impacts on the quality of life for local residents, including increased levels of stress and anxiety;
- air pollution and health impacts of emissions from vents, and odour from the vents and the proposed sewage treatment plant;

- noise impacts during construction and operation, and the need for acoustic sheds to be a condition of approval;
- impacts on local land values and the need to compensate local land owners for reduced property values;
- blasting impacts and the need for dilapidation reports;
- contamination of drinking water collected from roofs and the need to test water in rain tanks and, if necessary, provide alternative water supplies to residents;
- lighting impacts;
- lack of time to review and comment on modification documentation; and
- doubt over the viability of Appin Mine.

The Department notes that similar issues to those listed above were raised in the representations on the modification. In addition, several representations on the modification raised concerns that there was insufficient information provided in the Modification Report or Submissions Report on the consideration of specific alternative locations for the mine ventilation and access site.

5.3 Summary of Advice - Government Agencies

While none of the agencies objected to the modification, several commented on particular aspects and proposed recommended conditions. These comments and recommendations are summarised in **Table 3** below and considered in more detail in Section 6 of this report.

Table 3 | Agency Advice

Agency	Advice	Consideration and Conditions
Environment Protection Authority	• Did not object to the removal of the existing approval condition requiring discharges from the site to comply with discharge limits set in the site Environmental Protection License (EPL), given it duplicates existing legislation. • Noted that if the modification is approved, the applicant would be required to apply to the EPA for a variation to amend the existing EPL 2504 for the construction and operation of a sediment basin, sewage treatment plant and associated irrigation scheme. • Recommended a condition of approval or statement of commitment requiring connections of the facility to a centralised sewerage system when it is available in the area. • Accepted that the noise impact assessment follows general considerations in the guidelines *Noise Policy for Industry* (2012) and *Interim Construction Noise Guideline* (2009). • Recommended conditions requiring plans or strategies for the management of construction noise, odour and blasting. • Sought clarification about whether the Air Quality and Greenhouse Gas Assessment was based on the total proposed ventilation flow rates, and therefore worst-case impacts. Additional information provided by the applicant confirming that the assessment was based on worst-case ventilation flow rates.	• The Department notes that the existing condition requiring compliance with the EPL is a standard condition and should remain in the existing Project Approval. • The Department notes that the applicant has committed to connect the site to the centralised sewerage system should one become available during the life of the modification. • The Department has recommended a condition requiring a Construction Environmental Management Plan (CEMP) be prepared for the construction stage of the modification, including specific noise and air quality monitoring, mitigation and management measures. • The Department notes that the existing project approval requires the preparation and implementation of a Noise Management Plan, and that this plan will be required to be reviewed and updated to include specific noise monitoring, mitigation and management measures associated with the operation of the modification. • The Department agrees with the EPA that a site-specific Blast Management Plan and Odour Management Plan should be prepared and implemented for the modification and has recommended conditions accordingly. • The EPA supports the recommended conditions.
Department of Planning and Environment		
Water Group	• Intially requested further details about the augmentation of water supply works (tank, pipeline and standpipe) at VS6. • The ISubmissions Report confirmed that the minor water supply works proposed at VS6 have already been approved, and that the proposed works would not result in additional environmental impacts beyond those already approved and that the traffic impacts were incorporated within the Traffic Assessment Report for the modification. DPE Water accepted this outcome.	• The Department notes that the existing Statement of Commitments (SoC) at Appendix 6 of the project approval includes a commitment to manage all surface works in accordance with the *Guidelines for Controlled Activities on Waterfront Land* (DPIE Water, 2012). This will continue to apply to the modification.

Agency	Advice	Consideration and Conditions
	• Noted that any works on waterfront land as defined by the *Water Management Act 2000* must be in accordance with the *Guidelines for Controlled Activities on Waterfront Land* (DPIE Water, 2012).	
Biodiversity Conservation and Science Directorate (BCS)	• Considered that the biodiversity development assessment report (BDAR) for the modification was adequate except for the targeted survey for the endangered Spike Rice-flower (*Pimelea spicate*). • Additional surveys for the Spike Rice-flower were undertaken across the site in September and November 2021 following acceptable rainfall events, and a reference site known to contain the species was also visited. • BCS accepted the additional survey work and outcomes provided by the applicant in relation to the Spike Rice-flower.	• The Department has recommended a condition requiring the applicant to retire the ecosystem credits necessary to offset predicted impacts to vegetation as a result of the modification.
Department of Regional NSW		
Mining, Exploration & Geoscience (MEG)	• Raised no issues regarding the modification.	• Noted.
Resource Regulator	• Advised that it has no specific comments regarding mine safety or mine rehabilitation.	• Noted.
Transport for NSW (TfNSW)	• Requested that the Traffic Assessment Report specify when background traffic counts were undertaken and recommended that any counts undertaken during 2020 are not used or are validated with other known data due to influences of Covid 19. • In the Submissions Report, the applicant confirmed that the traffic counts were undertaken during October 2020 when there were no Covid-19 lockdowns or restrictions in Sydney, the Illawarra or adjoining regions. • Did not support the use of a seagull intersection at locations with a speed limit greater than 70 km/hour, including for the site access from Menangle Road. • Recommended an updated concept for this intersection in line with Austroads standards, including a swept path of the longest vehicle entering and exiting the site and maneuverability through the site. • In the Submissions Report, the applicant provided revised design features for the proposed intersection and committed to complete the detailed design and construction in accordance with Austroads standards and in consultation with Wollondilly Shire Council and TfNSW. • Noted that Menangle Road is not currently classified as an approved heavy vehicle route, and that further consultation and approval would be required for heavy vehicles to access the site via this road. Noted that mitigation works may be required.	• The Department has recommended that detailed design of the site access intersection with Menangle Road be prepared in consultation with and to the satisfaction of Council and TfNSW. • The Department notes that under the *Roads Act, 1993* the applicant will be required to obtain the necessary permits to transport heavy vehicles along the transport route. • The Department has recommended a condition requiring the applicant to prepare and implement an Infrastructure Management Plan in consultation with TfNSW to manage the potential future co-existence of the modification site with the OSOC1. • TfNSW supports the recommended conditions.

Agency	Advice	Consideration and Conditions
	• Supported the recommended Infrastructure Management Plan to enable the future development of the Outer Sydney Orbital Stage 1 (OSO1) with the proposed modification and recommended that the plan be included as a condition of approval.	
Subsidence Advisory NSW	• Understood that the proposal would not result in additional planned subsidence impacts and, as such, had no objection to the proposal.	• Noted.
Heritage NSW	• Noted that extensive field assessment and consultation with the local Aboriginal community had taken place to inform the Aboriginal Cultural Heritage Assessment Report (ACHAR) for the proposed modification and the support provided by the registered Aboriginal parties (RAPs) involved in the modification. • Advised that the proposed process for the reburial of Aboriginal objects outlined in the ACHAR was not correct and should be amended to describe a legally compliant process. • The Submissions Report included a revised process informed by the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW,* and a commitment to sending an addendum letter to the RAPs describing the amendment to the ACHAR.	• The Department notes that the existing project approval requires the preparation and implementation of a Heritage Management Plan (HMP), and that this plan will be required to be reviewed and updated to include specific Aboriginal heritage management measures associated with the construction and operation of the modification.
Local Government		
Wollondilly Shire Council (Council)	• Recognised the employment and economic contributions of mining and is generally supportive, provided impacts to natural and built features are not significantly adversely affected and are adequately managed. • Noted the short timeframe for the provision of comments. • Requested the completion of a groundwater assessment to identify potential impacts to groundwater within a localised context and in consideration of the *draft Characterisation and Modelling of Geological Fault Zones*. • Requested the assessment consider potential impacts on private bores and farm dams. As discussed in Section 6 of this report, a comprehensive groundwater assessment was subsequently prepared (refer to **Appendix A5**). • Requested an independent peer review of the air quality assessment, including specialist advice on the calculated greenhouse gas (GHG) emissions and an investigation of the capture of emitted gases from the BSOP shaft sites. • As discussed in section 6 of this report, the Department subsequently engaged an independent specialist, Katestone Environmental, to undertake an air quality peer review (refer to **Appendix A6**). • Katestone Environmental found that the air quality and GHG gas assessment was done in accordance with industry standards and methods, that GHG emissions had been calculated correctly using the appropriate emissions factors, and that the project is unlikely to adversely affect air quality.	• The Department has recommended conditions requiring: - landscape screening in consultation with Council and two visually impacted residents; - the updated Biodiversity Management Plan to include management of the Appin Mine Ventilation and Access Site; - the updated Surface Water Management Plan to include specific measures to manage the on-site sewage management system and trigger level for investigation adverse impacts on water resources or water quality; - blasting to be restricted to day time only, with future approval for out of hours blasting subject to demonstration that the airblast overpressure levels from the blasting complies with night-time sleep disturbance criteria; - blast monitoring require an automated monitoring system;

Agency	Advice	Consideration and Conditions
	• Noted the genuine community consultation effort which was considered consistent with good practice, and requested that a community engagement strategy be prepared for the construction and operation of the modification. • Requested a condition relative to landscape screening include reference to Council's *Draft Scenic Landscape Study and Management Strategy*. • In relation to biodiversity, requested: - that the existing Biodiversity Management Plan be updated to incorporate the modification; - that the updated Biodiversity Management Plan include mapping of identified areas of Derived Native Grasslands (DNG) and PCT 835 on the site and adjacent creekline; - that the development footprint avoid impacts to DNG; and - targeted surveys of all threatened flora and fauna within the BDAR, including for the Cumberland Plain Snail. • As discussed in Section 6 of this report, additional survey for the Cumberland Plain Snail was undertaken and shells found were sent to an expert in invertebrate taxonomy for identification. The expert confirmed that the snail shells were not Cumberland Plain Snail. • Requested the preparation of a site specific Water Management Plan. • Requested additional information the proposed site on-site sewerage management arrangements. As discussed in Section 6, this information was provided in the Submissions Report. • Recommended conditions permitting blasting during day time hours only, requiring blast monitoring by a specialist consultant in accordance with relevant Australian Standards and installation of an automated blast monitoring system. • Recommended specific conditions of consent for traffic management associated with the site access intersection, consultation and concurrence with Council on designs and the preparation of a site specific Traffic Management Plan.	- the intersection of the site with Menangle Road to be designed and constructed to the satisfaction of Council and TfNSW, and constructed prior to the commencement of construction of the shafts (site establishment and bulk earthworks may occur concurrently with the intersection upgrade); and - the Environmental Management Strategy to be updated in consultation with Council to include an engagement strategy for the Appin Mine Ventilation and Access site • The Department notes that the existing Biodiversity Management Plan, Water Management Plan and Traffic Management Plan would be required to be reviewed and updated to incorporate specific mitigation, management and monitoring outcomes associated with the modification.

6 Assessment

In assessing the merits of the modification application, the Department has considered the:

- Modification and Submissions Reports;
- agency, special interest group and public submissions;
- additional information provided by the applicant;
- previous environmental assessments for the BSOP;
- modification applications and existing conditions of approval; and
- requirements of the EP&A Act, including the objects of the Act.

The Department acknowledges that the proposed ventilation and access site is within an area that has not previously been subject to mining ancillary operations and is essentially a "greenfield site" in relation to impacts on sensitive receivers, such as rural residential properties in the area.

Therefore, the Department considers that the key assessment issues for the modification are related to amenity issues including noise, blasting, air quality and visual impacts, along with traffic impacts. A summary of the Department's consideration of these issues is provided below. Consideration of other issues is discussed in Section 6.6.

6.1 Noise

Noise Assessment

The location of the nearest residences to the site are shown on **Figure 4**. These include two rural residences located directly to the north (R2 and R16), approximately 180 m and 300 m from the proposed operational footprint respectively; and one residence located on a hill crest directly to the west (R3), approximately 280 m from the site operational footprint. A number of additional rural properties are located further afield, predominantly to the south-west of the site on the southern side of Finns Road. The residential receiver within the proposed site (R1) is mine owned.

The Modification Report included a Noise and Vibration Impact Assessment (noise assessment) prepared by RWDI Australia Pty Ltd (RWDI) that assessed construction, operational and road traffic noise in accordance with relevant NSW guidelines.

The proposed duration of construction activities associated with the modification (i.e. around 3 years from July 2022 to 2025) is significantly longer than that contemplated under the *Interim Construction Noise Guideline* (ICNG) for mining and industrial projects where the *Noise Policy for Industry* (NPfI) is the relevant guideline. The NPfI allows construction activities to be considered such that the ICNG could be applied, but defines these as *"activities that are related to establishment phase of a development and that will occur on site for limited period of time."*

For longer duration construction associated with mining projects, where receivers are exposed to higher noise levels for extended periods, the Department considers stricter noise criteria derived in accordance with the NPfI should apply along with the *Voluntary Land Acquisition and Mitigation Policy* (VLAMP).

The Department therefore requested further analysis of predicted noise levels for construction activities against the project noise trigger levels (PNTLs) derived in accordance with the NPfI, including any implications under the VLAMP. This information was included in the applicant's additional information reports (refer to **Appendix A5**) and is discussed further below.

Background noise monitoring associated with the noise assessment was conducted at four locations considered to be representative of the nearest and potential most affected sensitive receivers to the site. A community representation questioned why background noise monitoring was not conducted at R2 or R3. RWDI clarified that noise levels would not vary appreciably over that distance, and given traffic along Menangle Road is intermittent, noise measured near R1 would be representative of the background noise levels at receivers R2 and R3. The Department accepts this reasoning.

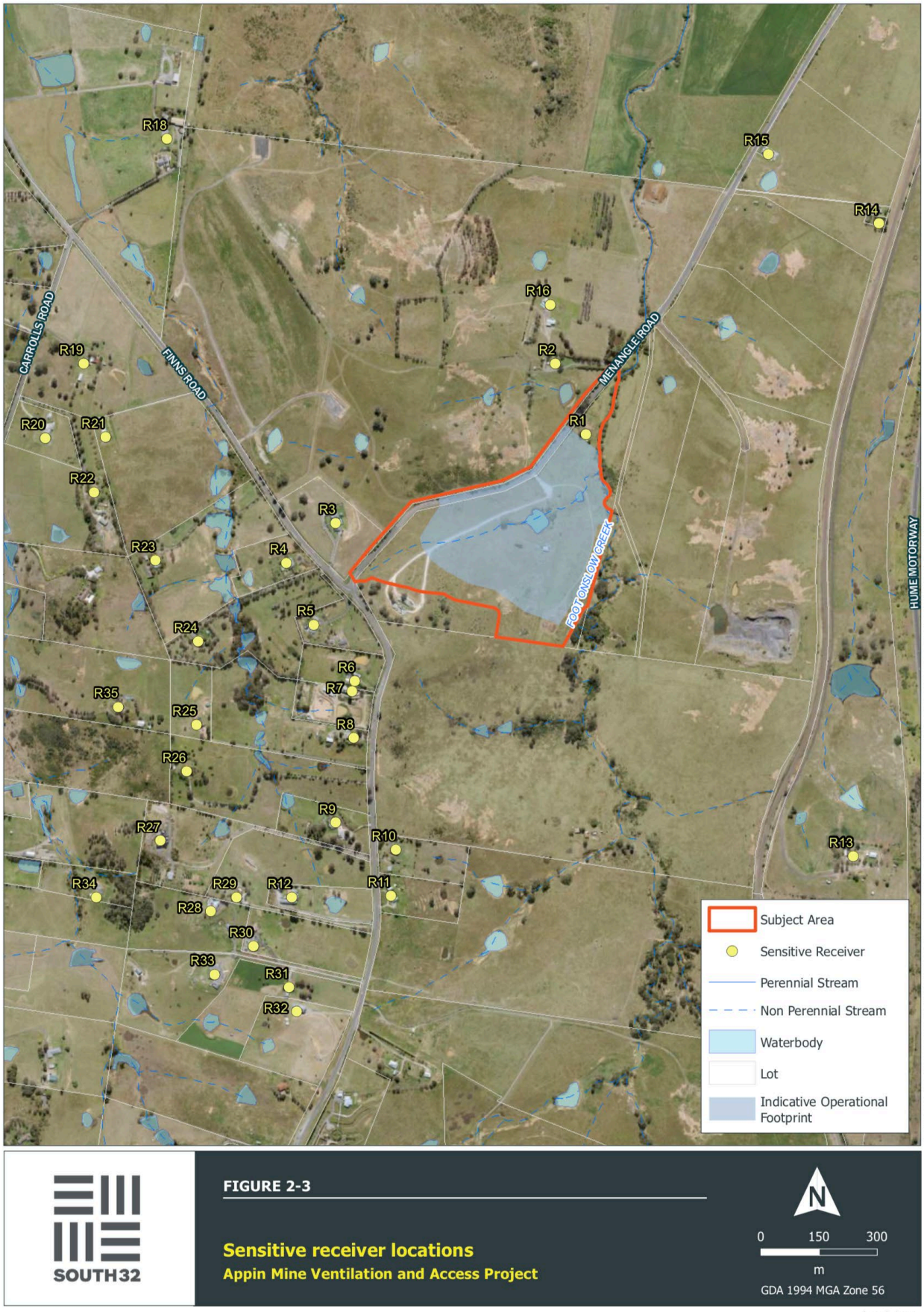


Figure 4 | Location of Sensitive Receivers

Schedule and Operating Hours

Construction and Operational Schedule

The indicative construction and operational schedule is provided in **Table 4**. Site establishment and construction activities, including shaft sinking and lining works and the construction of mine access infrastructure, are scheduled to take around 3 years.

Table 4 | Indicative construction and operational schedule

Activity	Start	Finish	Approximate Duration (months)
Construction:			
Site establishment, civil and earthworks, utilities, pre-shaft sinking and intersection upgrades	Jul 2022	Mar 2023	7
Power supply infrastructure	Mar 2023	May 2024	14
VS7 sinking and lining	Aug 2023	Dec 2024	17
VS8 sinking and lining	Jun 2023	Oct 2024	17
Fans, evase(s), ancillary site infrastructure	Feb 2023	Dec 2024	22
Mine access infrastructure (winder, headframe, etc)	Jul 2024	2025	12-18
Operation:			
Commissioning and operation of ventilation shafts	Nov 2024	2041	17 years
Commissioning and operation of mine access infrastructure	2025	2041	16 years
De-commissioning and rehabilitation	2041	2050	5 years

Hours of Operation

The applicant has committed to limiting the construction activities associated with the site establishment, civil and earthworks, utilities, pre-sinking and intersection upgrades to standard daytime construction hours (i.e. the periods between 7am – 6pm Monday to Friday, 8am – 1pm Saturday and no work on Sundays or public holidays).

As discussed below, given the noise exceedances predicted at surrounding residences during out of hours (OOHs) shaft sinking activities prior to the construction of acoustic sheds, the applicant has also committed to restrict shaft sinking construction works to standard daytime hours until the acoustic sheds are constructed. Once the sheds are constructed, it is proposed that shaft sinking activities would be undertaken 24 hours per day, seven days per week.

Once operational, it is proposed that the site would operate 24 hours per day, seven days per week.

Noise Criteria

The noise management levels (NML) derived in accordance with the ICNG and the operational project noise trigger levels (PNTL) derived in accordance with the *Noise Policy for Industry* (NPfI) are provided in **Tables 5** and **6**, respectively.

As can be seen by comparison with the operational noise limits in these tables, the daytime construction NML is 5 dB(A) higher than the day time PNTL [i.e. 48 dB(A) compared to 43 dB(A)]. However, the construction out-of-hours (OOHs) evening and night time NMLs and operation PNTLs for these periods are the same [i.e. 43 dB(A) and 39 dB(A), respectively].

Table 5 | Construction Noise Management Levels ($L_{Aeq(15\ mins)}$)

Receiver	Standard Hours	Outside Standard Hours		
	Day	Day	Evening	Night
All receivers	48	43	43	39

Table 6 | Project Noise Trigger Levels ($L_{Aeq(15\ mins)}$)

Receiver	Time of Day	Project Intrusiveness Noise Levels
All receivers	Day	43
	Evening	43
	Night	39

As noted above, the Department considers that it is unreasonable for surrounding receivers to experience high daytime construction noise levels for extended periods. It is therefore proposed that the daytime NML of 48 dB(A) apply to the initial construction operations (i.e. site establishment, civil and earthworks, utilities, pre-shaft sinking and intersection upgrades).

After these initial construction works are completed, it is recommended that the stricter daytime noise criteria of 43 dB(A) apply during all remaining construction activities and during the operational phase of the site. The noise modelling undertaken by the applicant predicts that this noise limit could be met at all receivers following the initial construction works with the application of reasonable and feasible noise mitigation measures.

Noise Mitigation and Management

Noise modelling predicted significant exceedances of up to 22 dBA of the PNTL at the nearest receiver (ID R2) during construction shaft sinking activities under noise enhancing conditions during the night period. Consequently, the applicant committed to install acoustic sheds or other noise mitigation over over the VS7 and VS8 construction areas to mitigate noise emissions during shaft sinking activities to ensure that the PNTL would be met at all receivers during out of hours operations.

The Department was concerned that there would be an extended period of time when shaft sinking activities would be undertaken during the day time period prior to the construction of acoustic sheds, and requested that the applicant provide additional information on other reasonable and feasible noise mitigation measures that could be put in place to reduce noise during this period.

The applicant subsequently committed to implement additional temporary noise control measures to mitigate noise emissions from daytime shaft sinking activities prior to the construction of the acoustic sheds, including operation of fans and scrubbers within an acoustic enclosure and construction of acoustic barriers close to the ventilation shafts. The applicant also committed to implementing a range of additional controls during the construction and operational phases of the modification, including:

- undertaking noise monitoring and actively managing site activities to determine compliance with noise criteria;
- training staff on noise issues and management measures;
- undertaking community consultation;
- avoiding using noisy plant simultaneously;
- orientating plant and equipment and operating loading and unloading away from receivers;
- use of mobile screens and noise barriers; and
- installing source attenuation on plant and equipment if required.

The Department supports these measures and notes that the existing project approval includes a noise operating condition requiring the applicant to implement best management practice, including all

reasonable and feasible noise mitigation measures, to minimise the construction, operational and road traffic noise generated by the project. This condition will continue to apply to the modified project.

Noise Predictions

Construction Noise

The worst case construction noise predictions for the key construction activities at sensitive receivers surrounding the site are presented in **Table 7**. The predictions include maximum noise levels with the implementation of the mitigation measures described above. The bracketed figures for the noise predictions during the initial site establishment, pre-sinking and intersection works indicate noise levels above the applicable NMLs.

Table 7 | Construction Noise Predictions ($L_{Aeq(15\ mins)}$) dB(A)

Location	Construction Activity		
	Site Establishment, Pre-sinking, Intersection works, etc	Shaft Sinking and Lining, Fans, Mine Access Infrastructure	
	Standard Hours (with mitigation)	Standard Hours (with mitigation / acoustic barriers)	OOH (with mitigation / acoustic sheds)
R2	**53 (+5)**	43	37
R3	**49 (+1)**	42	33
R13	44	38	28
R15	41	-	25
R16	45	40	30
All other residences	<37	<32	<22

Bracketed figures indicate exceedances above the applicable NML

The Department considers it important to make a clear distinction between shaft "pre-sinking" and "sinking" construction activities. The pre-sinking phase would involve the construction of a temporary headframe and winder, establishment of a shaft collar and intake evase, and the excavation of the shaft through Ashfield Shale rock to a depth of 30-50 m (depending on geological conditions) using mechanical excavation methods. At this stage the acoustic sheds would still be under construction and acoustic barriers would be the primary mitigation measure employed to reduce noise.

Once the Hawkesbury sandstone layers are encountered, the project would move into the shaft sinking stage. This would require larger blasts to break up the harder rock. However, at this stage of construction the acoustic sheds or alternative noise mitigation (determined during detailed design) would be in place to reduce noise.

In summary, the noise modelling indicates:

- exceedances of the day time NML of between 1-5 dB(A) at two receivers (R2 and R3) during site establishment, civil and earthworks, utilities, pre-shaft sinking and intersection upgrades;
- compliance with the day time PNTL during shaft sinking activities with mitigation and acoustic barriers; and
- compliance with the OOH PNTLs during shaft sinking activities with mitigation and acoustic sheds.

The Department considers that noise levels of between 1-5 dB(A) above the day time NML at two receivers for the initial period proposed to complete site establishment, civil and earthworks, utilities,

pre-shaft sinking and intersection upgrade activities is acceptable. The Department considers that the impact of the construction noise on the community may be further reduced by implementation of other administrative mitigation measures discussed above, particularly ensuring ongoing consultation and notification programs with the community and strategies to promptly deal with and address noise complaints as required by the ICNG. The Department has recommended conditions restricting the initial construction activities to day time only and requiring them to be managed in accordance with the requirements of ICNG.

The Department considers that noise level predictions for the shaft sinking construction activities are acceptable once all reasonable and feasible mitigation measures are implemented, in particular:

- the construction of acoustic barriers at both ventilation shafts prior to the construction of the acoustic sheds; and
- restricting shaft sinking activities to day time only until the acoustic sheds are constructed.

The Department has recommended construction noise conditions to reflect the above, as well as a condition requiring the applicant to ensure that the noise generated during shaft sinking activities does not exceed the stricter noise impact assessment PNTLs derived in accordance with the NPfI. The Department has recommended that these measures be described in detail in a site specific Construction Environmental Management Plan (CEMP).

On this basis, the Department accepts that construction-related noise associated with the modification is unlikely to result in adverse amenity impacts to local residences.

Operational Noise

The noise assessment predicted that the most significant operational noise scenario associated with the site would involve the simultaneous operation of the two ventilation fans, the electrical substation, mine access operations and the water treatment plant. These operations would also involve movement of mobile plant such as trucks, forklifts and car movements.

This worst case operational noise scenario was modelled using noise enhancing meteorological conditions. In summary , the operational noise modelling indicated compliance with the PNTLs provided in **Table 6** at all times and at all receivers. The closest receiver to the site operations (R2) is predicted to experience worst case noise levels of 38/38/37 dB(A) during day/evening/night periods, which is less than the respective PNTLs of 43/43/39 dB(A).

The Department has recommended a condition requiring the operational noise levels to comply with the PNTLs derived in accordance with the NPfI.

Low-frequency Noise

RWDI analysed predicted operational noise levels at the nearest affected residential property (R2) against low frequency noise modifying factors in accordance with the NPfI. This receiver was predicted to be the only location where low frequency noise above the octave thresholds potentially exist and where the addition of a penalty for low frequency noise could affect the predicted compliance with the PNTLs.

The analysis determined that if a 2 dB penalty were to be applied at receiver R2, then the predicted night time $LA_{eq,15min}$ operational noise level of 37 dBA under noise enhancing meteorological conditions would be increased to 39 dBA. RWDI confirmed that the noise level would still comply with the night time PNTL of 39 dBA at R2.

The Department notes that the proposed mitigation measures, particularly construction of acoustic sheds, would also reduce the tonality or low frequency noise characteristics at nearby receivers. The Department has recommended that the applicant assess monitoring results with respect to modifying factors for low-frequency noise, and apply factors if monitoring results are found to contain dominant low-frequency content, in accordance with Fact Sheet C of the NPfI.

Sleep Disturbance

RWDI assessed the potential for sleep disturbance from maximum noise level events from the site during the night-time period. The maximum noise levels during site operations were identified as the audible alarm that sounds prior to the operation of the winder/cage, or the reversing alarm on the forklift. Based on previous noise measures for these sources, it was determined that the maximum noise levels from the site at the nearest receiver (R2) would be in the order of 37 dBA, which is below the maximum noise trigger level of 52 dBA. On this basis, a more detailed sleep disturbance assessment was not required.

Notwithstanding these results, in response to concerns raised by a nearby resident about the alarm noise, the applicant committed to investigating alternatives to the use of warning alarms. These include the use of visual signals (lights etc.) instead of an audible alarm, or designing the alarm to avoid noise spill. The Department accepts this approach and has included a condition requiring the outcome of the investigations to be included in the updated Noise Management Plan (NMP) for the modified Project.

25% Land Assessment

RWDI confirmed that no privately owned property is predicted to experience exceedances of the NPfI land noise criteria on more than 25% of the land where there is an existing dwelling or where a dwelling could be built under existing planning controls.

Road Traffic Noise

RWDI completed an assessment of road traffic noise at the nearest affected residences along Menangle Road during both the construction and operational phases of the proposed modification, in accordance with the *Road Noise Policy*.

During construction, the sensitive receivers most potentially affected by road noise are those located along Menangle Road to the north of the site, which would experience an increase of approximately 152 light vehicle and 72 heavy vehicle movements during the day and up to 16 heavy vehicle movements (concrete deliveries) during the night. RWDI predicted that this would result in increases in road noise at the potentially affected receivers of 0.6 dB(A) during the day and 0.9 dB(A) during the night, which would comply with the *Road Noise Policy* criteria (i.e. <=2 dB(A) relative increase).

During operation, the sensitive receivers most potentially affected by road noise are those located along Menangle Road to the south of the site, which would experience an increase of approximately 555 light vehicle and 22 heavy vehicle movements during the day and 164 light vehicle movements during the night. RWDI predicted that this would result in increases in road noise at the potentially affected receivers of 0.3 dB(A) during the day and 0.6 dB(A) during the night, which would comply with the RNP criteria.

The Department notes that the applicant has committed to ensuring that no heavy vehicle movements associated with the operation of the site would occur at night. The Department has recommended a condition to ensure this the case. The Department also notes that the existing noise operating conditions require the applicant to implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the road traffic noise generated by the project. On this basis, the Department accepts that road traffic noise associated with the modification is unlikely to result in adverse amenity impacts to local residences.

Noise Monitoring

The existing noise monitoring program for the Project is described in the approved Noise Management Plan (IMC, December 2020), and in accordance with existing conditions of approval (Condition 5f, Schedule 4) involves continuous real-time noise monitoring and attended noise monitoring at locations representative of the privately-owned receivers most likely to be affected by noise generated by the Appin Mine sites. The Noise Management Plan would be required to be updated and reviewed to take into account the operation of the mine ventilation and access site. As noted above, the Department has recommended that construction related noise monitoring and management measures at the site be described in a site specific CEMP.

In accordance with the existing monitoring program, the Department has included a requirement that real-time and attended noise monitoring be conducted at the mine ventilation and access site, particularly during construction. The operation of a real-time monitoring and pro-active noise management regime is considered important during the extended construction period to guide day-to-day operations and minimise potential noise impacts on surrounding residents. Attended monitoring would be used to determine compliance with the relevant noise criteria for the site.

Conclusion

The Department considers that the noise assessment and additional noise related information provided by the applicant is adequate to assess noise associated with the modification. However, given the proposed prolonged construction period (i.e. up to 3 years) the Department has recommended that the NMLs derived in accordance with the ICNG only apply during the initial construction period when site establishment and shaft pre-sinking activities are being undertaken. After this time, stricter criteria derived in accordance with the NPfI would apply.

The Department accepts that with the implementation of reasonable and feasible mitigation measures, in particular the construction of acoustics barriers/sheds and restricting construction activities to standard daytime construction hours until the acoustic sheds are in place, the applicable noise criteria can be met and nearby receivers are unlikely to be adversely impacted by noise generated during construction or operational activities at the site. The Department has recommended that the applicant operate a real-time monitoring and pro-active noise management regime at the mine site to ensure this is the case.

Subject to the existing and recommended noise conditions, the Department considers that the potential noise impacts of the modification on surrounding residents are acceptable.

6.2 Blasting

Blasting Assessment

The noise assessment included a blasting impact assessment which assessed the potential ground vibration, airblast overpressure and flyrock impacts associated with blasting during the construction of the ventilation shafts. A key issue for the Department and concerns raised in submissions was that blasting was proposed to be undertaken outside standard construction hours and potential associated amenity impacts at residences.

The blasting impact assessment was prepared in accordance with *Assessing Vibration: A Technical Guideline* (DEC, 2006) and considered the *Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration* (ANZECC Guideline) (ANZECC, 1990).

During the assessment process, the Department requested additional justification and assessment for OOH blasting activities. This information was included in the applicant's additional information report (refer to **Appendix A5**) and is discussed further below.

Blasting Method and Schedule

Construction of the ventilation shafts would require the use of small explosive blasting charges to break up hard rock, such as sandstone, into removable pieces. The broken material would then be removed from the shaft using machinery such as excavators. The Department notes that is a common excavation methodology that has been safely used on many other Australian projects, including relatively shallow tunnelling projects.

In consideration of the construction program, blasting cycle and the need to minimise impacts on sensitive receivers, the applicant proposed a two phased approach to undertaking blasts, including:

- Phase One:
    - aligns with the pre-sink phase when activities are at or near the surface and acoustic sheds are still under construction;
    - blasting restricted to standard construction hours (9.00am – 5.00pm Monday to Saturday).

- Phase Two:
  - aligns with the main-sink phase when shafts have reached a depth of approximately 30-50m and the acoustic sheds have been constructed;
  - blasting to occur 24 hours a day, 7 days a week.

During each phase up to one construction blast per shaft, per 24 hour period is proposed (i.e. two blasts per 24 hour period at the site).

Blasting Criteria

The blast criteria specified in **Table 8** below are intended to avoid annoyance (i.e. amenity) impacts from blasting activities. RWDI indicated that damage to structures typically occurs at significantly higher overpressure (>133 dBL) and vibration (>20 mm/s) levels than those which lead to annoyance. Therefore, RWDI indicated that compliance with these criteria would ensure negligible risk of damage to off-site structures from blasting activities.

Table 8 | Daytime Blasting Criteria

Location	Airblast overpressure [dB(Lin Peak)]	Ground Vibration (mm/s)	Allowable Exceedance
Privately owned residences	120	10	0%
	115	5	5% of the total number of blasts over a calendar year

Blasting Predictions

Airblast Overpressure and Ground Vibration

Table 9 presents the maximum predicted airblast overpressure and ground vibration levels associated with blasting during the construction of VS7 and VS8 for the closest privately owned residences (refer to **Figure 4**). Predictions were based on a maximum instantaneous charge (MIC) of 3 kilograms (kg) with no mitigation.

RWDI confirmed that the predicted vibration levels are well below the most stringent criterion (i.e. 5 mm/s) at all of the closest sensitive receivers. However, the predicted overpressure levels exceed the criterion (i.e. 115 dBL) by up to 8 dBL at eight receivers. Residences located further from the blast locations than those presented in **Table 9** would experience airblast overpressure and ground vibration levels well below applicable blasting criteria.

It is noted that the predicted blasting impacts are well below the overpressure (>133 dBL) and vibration (>20 mm/s) levels which may result in damage to residences and other structures.

Table 9 | Blasting Criteria – Privately Owned Residences

Receiver	Distance to Blast (m)		Airblast overpressure [dB(Lin Peak)]		Ground Vibration (mm/s)	
	VS7	VS8	VS7	VS8	VS7	VS8
R2	413	549	**123 (+8)**	**119 (+4)**	0.7	0.5
R3	529	503	**120 (+5)**	**120 (+5)**	0.5	0.5
R4	654	606	**117 (+2)**	**118 (+3)**	0.3	0.4
R5	631	554	**117 (+2)**	**119 (+4)**	0.4	0.4
R6	628	520	**117 (+8)**	**120 (+8)**	0.4	0.5

Receiver	Distance to Blast (m)		Airblast overpressure [dB(Lin Peak)]		Ground Vibration (mm/s)	
	VS7	VS8	VS7	VS8	VS7	VS8
R7	650	539	**117 (+2)**	**119 (+4)**	0.3	0.5
R8	728	605	**116 (+2)**	**118 (+3)**	0.3	0.4
R9	924	794	113	114	0.2	0.3
R10	908	771	113	115	0.2	0.3
R16	552	687	**119 (+4)**	**116 (+2)**	0.4	0.3
R23	991	948	112	112	0.2	0.2
R24	929	857	113	114	0.2	0.2

Bold type indicates exceedances of the blast criteria presented in Table 5, with bracketed numbers representing the level of the exceedance

RWDI noted that the predicted blast impacts should be regarded as indicative only. Blast overpressure and vibration levels are difficult to accurately predict as they are dependent upon several factors, including blast design, meteorological conditions (overpressure only), properties of the site (rock type, terrain etc) and the distances involved. RWDI confirmed that overpressure levels at sensitive receivers are anticipated to be significantly lower than those presented above due to the vertical orientation of the vent shafts associated with the modification, which is not accounted for in the predictions.

Further, RWDI indicted that a range of mitigation measures are available to reduce blast overpressure, including:

- blast design, considering options such as limiting diameter and length of rounds, splitting the round into two benches and/or adjusting blast hole firing sequence (up to **5 dB** reduction);
- use of blast mats and water curtains (up to **5-10 dB** reduction); and
- construction of acoustic sheds (**10 dB** or more reduction).

The applicant has committed to implementing these measures to ensure that the blast criteria in Table 8 would be met. – noting that the construction of the acoustic shed in itself would reduce the overpressure levels to below the amenity criteria.

The Department accepts that airblast overpressure could be controlled to within acceptable levels by blast design and other identified mitigation measures for daytime blasting activities. However, the Department is concerned that even with controls and mitigation in place, the airblast overpressure levels could remain unacceptably high during night time periods and may cause annoyance and sleep disturbance for surrounding residences.

The Department notes that approval for evening and night-time blasting activities that lead to significant levels of blast overpressure at receivers is extremely rare and typically not permitted in NSW. Rather, blasting impacts are managed by restricting this activity to the day time periods only.

During the assessment process, the Department requested the applicant provide further justification of why blasting activities are required outside of standard daytime hours, and the implications of restricting blasting to the daytime periods only. The applicant advised that the intent of blasting outside daytime hours is to reduce the overall duration of construction operations.

Due to the sequential nature of a blast cycle and the variables that may impact the day-to-day progress of shaft sinking, the applicant indicated that it is difficult to plan a precise and regular blast time over the entire construction period. This is because shaft sinking rates vary with ground conditions encountered during construction. For example, increases in water inflows, poor ground conditions or hard ground would slow the shaft sinking due to the time taken to employ mitigations or to shorten blast rounds.

As noted in Section 6.1 above, shaft sinking activities are currently scheduled to take approximately 17 months, based on blasting and construction activities being undertaken 24 hours a day, 7 days a week during Phase Two. If blasting was restricted to day time periods only for the entire construction period, the applicant has advised that shaft construction would indicatively take an additional 5 months.

The Department also notes that the blasts would occur at increasing depth as the shafts are sequentially excavated towards their final depths (approximately 591 m for VS7 and 560 m for VS8) and therefore blast overpressure at sensitive receivers would reduce over the construction period. Additional information provided by RWDI indicated that up to a 12 dB reduction in blast overpressure levels could result with depth of greater than around 50m (refer to **Appendix A5**).

Flyrock

RWDI indicated that with tight controls and best practice procedures, fly rock can be safely controlled. Options for controls, particularly for initial (shallow) surface blasts prior to the construction of the acoustic sheds, include utilising smaller diameter (stemmed) blast holes on a reduced round length and additional buffering. The applicant committed to developing controls during detailed design.

To manage safety risks associated with flyrock, the Department has recommended that specific measures be included in the Blast Management Plan (see below) demonstrating that blasting can be carried out without compromising the safety of people (including road users) or livestock.

Blasting Mitigation and Management

The applicant has committed to implementing an extensive range of blast mitigation and management measures to ensure safe and effective construction blasting and to minimise amenity impacts on sensitive receivers to acceptable levels. In summary, these include:

- preparing and implementing a site specific Blast Management Plan, including a detailed blast monitoring program;
- developing a 'site law' during the detailed design phase of the project including:
  - conducting small scale trial blasts to confirm blast design parameters;
  - confirming monitoring results are in-line with predictions, and if not, investigating additional mitigation measures such as blast mats and water curtains; and
  - optimising blast procedures to ensure construction blasts comply with applicable criteria and adequately control flyrock;
- restricting Phase One blasts during the pre-shaft sinking activities to standard construction hours only;
- utilising the data and feedback collected during Phase One to review and revise the Blast Management Strategy prior to the commencement of Phase Two blasting.

In accordance with recommendations from Council, the applicant also committed to engage an appropriately qualified person to oversee the process of blasting, including blast planning and design, supervision of blasting process, and review of monitored blasting outcomes. The Department has recommended a condition to ensure this occurs.

As stated above, the Department accepts that airblast overpressure can be controlled to within acceptable levels by blast design and other mitigation measures for daytime blasting activities. Consequently, the Department has recommended conditions allowing blasting during standard hours and requiring that all blasts do not cause exceedances of the blast criteria specified in **Table 8**.

However, the Department does not consider it appropriate to approve OOH blasting unless the applicant can demonstrate that the blasting would not cause annoyance or sleep disturbance for surrounding residences. In order for this to be achieved, the Department considers that airblast overpressure levels from blasting should comply with the sleep disturbance criteria established under the NPfI [i.e. maximum noise level L_{Amax} of 52 dB(A)].

The Department has therefore recommended an adaptive management approach, restricting blasting to standard hours until the applicant can demonstrate compliance with the strict NPfI sleep disturbance criteria. OOH blasting would require subsequent approval of the Planning Secretary.

The Department acknowledges that this may result in a prolonged construction period of a few months, however considers this is necessary in order to preserve the amenity of surrounding residences.

The Department has recommended a condition requiring the preparation and implementation of a site specific Blast Management Plan, together with a detailed monitoring program for evaluating and reporting on compliance with the blast criteria, including a real-time automated monitoring program and public notification procedures to enable members of the public, particularly surrounding residents, to get up-to-date information on the proposed blasting schedule.

Several submissions raised blasting impacts on amenity and the structural integrity of homes and associated structures as a concern, and requested that dilapidation reports be required prior to blasting operations commencing. Although the Department accepts that the predicted blasting impacts are well below the overpressure and vibration levels that could typically result in damage to houses and other structures, as a precaution the Department has recommended conditions allowing the owners of privately owned residence located within 1 km of the vent shafts to have a property inspection to establish the baseline condition of any buildings and structures on their land prior to the commencement of any blasting operations.

If the owner of any privately-owned land within 1 km of the vent shaft claims in writing that buildings or structures on their land have been damaged as a result of blasting on the site, then within 2 months of receiving this written claim the applicant must:

(a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties to investigate the claim; and

(b) give the landowner a copy of the property investigation report.

If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the applicant must repair the damage to the satisfaction of the Planning Secretary.

Conclusion

The Department acknowledges that airblast overpressure criteria is predicted to be exceeded at some residences surrounding the site during shaft sinking activities. However, the Department notes that there are a range of standard construction blast design controls and mitigation measures (blast mats, water curtains and sheds) that can be implemented to ensure compliance with applicable criteria and minimise amenity impacts to acceptable levels during shaft construction activities.

The Department has recommended an adaptive management approach to blasting which restricts blasting to standard construction hours unless the applicant can demonstrate compliance with the strict NPfI sleep disturbance criteria. Any OOH blasting would require subsequent approval of the Planning Secretary.

The Department has recommended strict operating and management conditions to ensure the blast impacts of the modification are managed appropriately. This includes the preparation of a Blast Management Plan, including a comprehensive real-time automated monitoring program. The Department has also recommended a condition allowing landowners to request an independent review of impacts at their property, should they consider the Project to be exceeding the relevant blasting criteria.

6.3 Air Quality

Air Quality Assessment

Submissions and representations raised concerns about the health impacts from emissions, including from contamination of drinking water due to dust particles landing on roofs and settling in rainwater tanks and windborne silica dust from excavated material.

The Modification Report included an Air Quality and Greenhouse Gas Assessment (air quality assessment) that was prepared by EMM Consulting Pty Ltd (EMM) in accordance with *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2017) (EPA's

Approved Methods). The air quality assessment modelled air quality emissions during the construction and operation of the site, including incremental and cumulative particulates, gases and odour emissions.

NSW Health did not provide comment on the modification, and the EPA did not raise concerns in this regard. However, the Department engaged an independent expert, Katestone Environmental (Katestone), to review the air quality assessment and additional information provided by EMM in response to requests from the Department.

Katestone concluded that the model was generally adequate to predict impacts and that construction and operation of the Appin vent shaft and access project and would be unlikely to adversely affect air quality (see **Appendix A6)**.

Air Quality Impacts

Dust and Particulate Matter

During construction, EMM indicated that dust and particulate matter would be generated from stripping of vegetation and topsoil, stockpiling, excavation and handling of bulk material, and from ventilation shaft construction (including blasting).

The applicant committed to mitigating air quality impacts from construction activities through implementation of a range of measures, including:

- watering spraying of haulage roads and exposed areas;
- minimising disturbance areas;
- revegetating long term stockpiles
- preventing truck overloading and minimising spoil drop heights from trucks; and
- shaft sinking within acoustic sheds.

During operations, particulate matter would be discharged in mine ventilation air from upcast VS8. The VS8 fan facilities have been designed to minimise air quality impacts associated with particulates by directing emissions away from residences to the north, west and south west and towards the Hume Highway transport corridor. Further, mine ventilation air would be discharged through evases at an angle of ~45 degrees to ensure the plume has initial momentum flux to aid dispersion of particulates.

EMM undertook dispersion modelling for the construction and operational phases of the project. In summary, the air dispersion modelling indicated that incremental and average annual levels of particulates would comply with the applicable criteria at all sensitive receivers.

EMM predicted that the highest incremental contribution for 24-hour average PM_{10} and $PM_{2.5}$ at the closest sensitive receiver R2 were 6.1 $\mu g/m^3$ and 2.1 $\mu g/m^3$, respectively. When background concentrations were included, there were no additional days over the 24-hour average impact assessment criterion for either PM_{10} or $PM_{2.5}$.

EMM also specifically addressed the issue of potential contamination of drinking water due to dust particles landing on roofs and settling in rainwater tanks in the air quality assessment and confirmed that the predicted deposited dust levels for the site are less than 5% of the relevant criterion for nuisance dust at all assessment locations.

EMM referenced previous studies that have shown that dust fallout at levels higher than this do not constitute a risk to locally collected drinking water.

Silica

In relation to community concerns about potential health impacts from windborne dust from the proposed stockpiles/bunds surrounding the site containing silica, EMM provided additional analysis of the potential for respirable crystalline silica to impact sensitive receivers.

As noted above, the highest predicted annual average $PM_{2.5}$ concentration at an off-site residential location is 2.1 $\mu g/m^3$. EMM made the conservative assumption that all $PM_{2.5}$ emissions generated during construction would contain 76.4% silica, resulting in a maximum annual average prediction for respirable crystalline silica being 0.15 $\mu g/m^3$.

Although NSW does not have standards for crystalline silica in ambient air, EMM noted that this figure is about 5% of the EPA Victoria chronic exposure limit of 3 $\mu g/m^3$ for mining and extractive industries. Based on these predictions, EMM concluded that there would be no potential health risk from silica dust emissions at an off-site residential locations as a result of the modification.

Katestone noted that although EMM's assessment did not include background levels of respirable crystalline silica in its analysis, a separate human health risk assessment for respirable crystalline silica undertaken in 2020 summarised levels reported respirable crystalline silica for various locations around the world and in Australia and concluded that a conservative background level would be 1.9 $\mu g/m^3$.

If that background figure was added to the maximum predicted concentrations for the vent shaft and access project, Katestone noted the project would still comply with the EPA Victoria criterion.

Gaseous Emissions

EMM indicated that mine ventilation air can include oxides of nitrogen (NO_x), sulphur dioxide (SO_2), carbon monoxide (CO), carbon dioxide (CO_2) and volatile organic compounds (VOCs). To assess the potential concentration levels of these pollutants, EMM used measured air extracted from Appin Vent Shaft 6, as well as bag samples of return air collected from underground at the Appin West Colliery. All results showed concentrations that were either non-detectable or well below relevant air quality goals.

EMM's modelling of the incremental and average annual levels of NO_x (applied as nitrogen dioxide NO_2) from the operation of the ventilation shafts confirmed that the applicable criteria would not be exceeded at any of the sensitive receivers. The highest modification 1-hour average NO_x concentration (65 $\mu g/m^3$) was approximately 26% of the impact assessment criterion, and the highest cumulative 1-hour average NO_x concentration (95.8 $\mu g/m^3$) was approximately 39% of the impact assessment criterion.

Consequently, the Department is satisfied that no adverse impacts from any of these pollutants would occur as a result of the modification.

Odour

EMM assessed potential odour impacts in two ways, using emission rates derived from the measured odour concentration as hydrogen sulphide (H_2S), and using emission rates derived from the measured sulphur compounds in the underground return air.

As noted above, the fan evases have been designed such that they would be located away from residential receivers and at an angle to aid dispersion of any odours.

EMM predicted that all assessment locations would be below the most stringent odour and H_2S impact assessment criteria for worst-case scenarios in both 2025 and 2033. EMM acknowledged that, given the dispersion modelling was based on the 99th percentile predictions during 'typical' mining operations, there may be occasions when odour emissions are higher than what was predicted. However, EMM indicated that this uncertainty is accounted for by the margin of safety in the modelling results, with the highest modelling prediction being 50% of the adopted impact assessment criterion for odour.

The EPA indicated that the operation of vent shafts in the Southern Coalfields have generated offensive odours during operation from time to time and that Section 129 of the Protection of the Environment Operations Act (1997) *'Emission of odours from premises licensed for scheduled activities'* makes it an offence to cause offensive odours from a premised to which a licence applies. Consequently, the EPA recommended that if approval is given, a detailed Odour Management Plan is required as a condition of approval.

The Department is satisfied that the odour assessment is appropriate, conservative and robust. Nevertheless, in accordance with the EPA's recommendation, the Department has recommended that the mine's existing Air Quality and Greenhouse Gas Management Plan be revised to include specific Odour Management Plan for the operation of the ventilation shafts at the site. Further, the Department notes that the existing conditions of approval require the applicant to ensure that no offensive odours are emitted from the site, as defined under the POEO Act.

Air Quality Monitoring and Management

The applicant currently monitors and manages air quality impacts associated with its existing operations in accordance with an approved Air Quality Management Plan.

A fixed monitor for real-time monitoring of particulate matter was installed at the Ventilation Shaft No. 6 site in May 2021 and is used to monitor particulate matter (PM_1, $PM_{2.5}$, PM_4 and PM_{10}) on a continuous basis. Data from this monitor is currently used as an adaptive management tool to inform operational activities and enable mitigation measures to be implemented during adverse conditions. Data from the monitor is made available to the Appin Mine CCC and community members on request and has been used be used to investigate complaints or events.

The Department has recommended that a similar monitoring system be employed at the Appin site to inform day-to-day operations during construction and operations. Further, in relation to gas emissions and odour associated with the operation of the ventilation fans, the Department has recommended periodic monitoring of mine ventilation emissions, particularly immediately following commissioning, to confirm compliance.

The Department has recommended that these monitoring methods be described in an updated Air Quality Management Plan.

Conclusion

The Department notes that the existing project approval requires the applicant to implement best practice air quality management on site, including all reasonable and feasible measures to minimise the off-site odour, fume and dust emissions (Schedule 4, condition 11 (a)). These conditions will also apply to the ventilation and access site.

The Department accepts the EPA's advice and the independent advice of Katestone, that the air quality assessment and associated modelling for the modification has been appropriately prepared in accordance with the EPA's Approved Methods. Based on this modelling, and experience from other mine ventilation shaft sites, the Department accepts that the operation of the site is unlikely to result in unacceptable amenity or health issues to the surrounding residences.

Subject to implementation of the existing and recommended conditions, the Department considers that the potential air quality impacts of the modification, including odour impacts, would be acceptable.

6.4 Traffic

Traffic Assessment

The principal roads that would serve the site include Menangle Road, Picton Road and the Hume Highway/Motorway (refer to **Figure 2**). Access to the site is proposed via a new T junction intersection in Menangle Road, north of Finns Road.

The Modification Report included a traffic assessment that was prepared by Transport & Urban Planning Pty Limited (TUP) in accordance with the *Guide to Traffic Generating Developments* (RTA, 2002) and applicable Austroads guidelines.

Several submissions and representations on the modification raised traffic accidents and road safety issues as a concern, noting that Menangle Road near the proposed site entrance is a crash zone and that numerous traffic accident have occurred along the proposed traffic route.

The Department subsequently requested that the traffic assessment be revised to consider the accident history of the road network in the vicinity of a site, including any provisions to reduce the potential for accidents. This information was included in the applicant's additional information reports (refer to **Appendix A5**) and is discussed below.

In addition, TfNSW indicated that it did not support the seagull intersection initially proposed for the site access from Menangle Road and recommended an updated concept in line with Austroads standards.

As discussed below, an updated intersection design was provided by the applicant in the Submissions Report.

Road Accident History

The road crash study provided as an addendum to the traffic assessment showed that for the 3 year period from January 2018 to December 2020 there were 22 road accidents along the full length of Menangle Road (between the Nepean River to the north of the site to Picton Road to the south: The study showed that:

- the accidents occurred at different locations along the full 10 km length of Menangle Road, with one minor accident recorded in the vicinity of the proposed site entrance along Menangle Road;
- the accidents included a relatively high proportion of single vehicle crashes including motor bikes;
- a number involved excessive or inappropriate speed; and
- the majority of the crashes were non-intersection type crashes.

TUP's analysis did not identify any specific location and/or pattern along Menangle Road that could be treated by a specific engineering remedial measure to address the incidence of road traffic accidents.

Proposed Site Access and Parking

In accordance with requests from Council and TfNSW, the applicant has committed to design and construct the intersection to Austroad standards. The applicant has proposed that the design would incorporate a left turn auxiliary lane (AUL) for Menangle Road for left turns into and out of the site; a right turn bay (CHR treatment) on Menangle Road for right turns into the site; and eastbound and westbound through lanes on Menangle Road. The applicant has also committed to complete road safety audits, both pre and post construction of the intersection, to ensure best practice road safety is achieved.

The Department has recommended that detailed design of the intersection be prepared in consultation with, and to the satisfaction of, Council and TfNSW, and that the intersection must be constructed before shaft sinking activities occur on site. The applicant has committed to designing and constructing the internal site roads in accordance with the applicable standards and provide car parking for 212 cars, including accessible spaces, which would be sufficient to cater for the maximum parking demands.

Predicted Traffic Impacts

Operational Traffic

The proposed site shift times would be spilt into three shifts on weekdays (Monday to Thursday: 6am – 3pm, 2pm-11pm and 10pm-7am) and two shifts on weekends (Friday to Sunday: 6am-6pm and 6pm-6am). TUP indicated that the majority of the workforce (93%) will likely arrive from and depart to the south along Menangle Road via Picton Road, and the remainder (7%) will arrive from and depart to the north via Menangle Road. This is also the case for heavy vehicles. Key proposed transport routes are shown in **Figure 5**.

The weekday traffic volume increases along Menangle Road due to the operation of the site compared to existing traffic volumes are provided in **Table 10** below. Operation of the site would result in relatively minor increase in traffic volumes along Menangle Road to the north (1.2%) with a higher contribution from the south (9.6%) of the site.

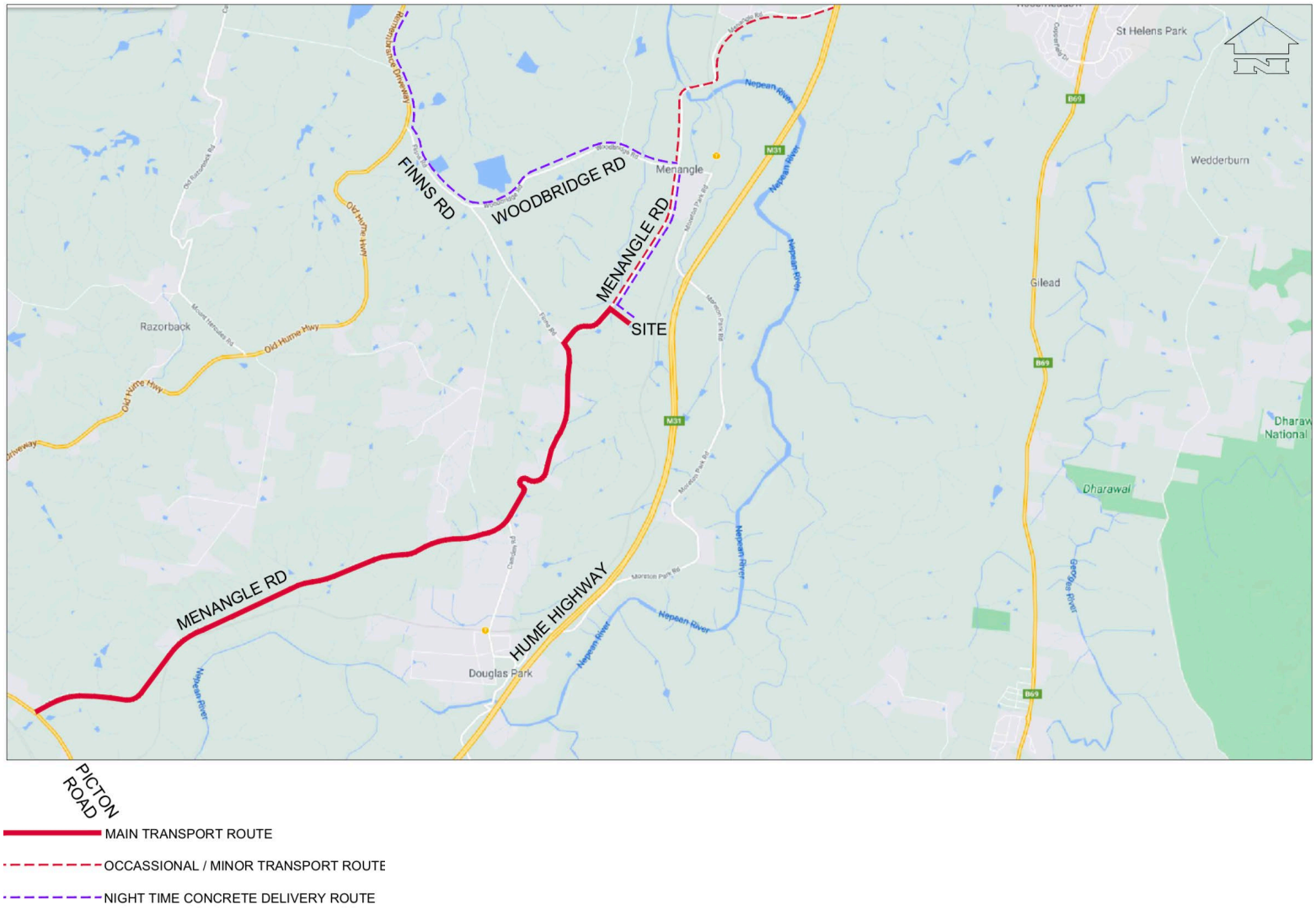


Figure 5 | Proposed Construction and Operation Transport Routes

Table 10 | Predicted Weekday Traffic Volume Increases

Location	Existing average vehicles per day (Vpd)	Modification increase in vpd	% increase
Menangle Road between Woodbridge Road and St James Avenue (north of site)	3,622	43 (including 2 heavy vehicles)	1.2
Menangle Road south of Finns Road (south of site)	5,760	555 (including 22 heavy vehicles)	9.6

TUP modelled the potential impact of this volume of traffic on the surrounding intersections, including:

- Menangle Road/Woodbridge Road/Station Street;
- Menangle Road/Finns Road; and
- Menangle Road/site entrance.

The AM and PM peak hours were modelled for 2020 (existing conditions) and a 2025 traffic scenario to account for background traffic growth (10% between 2020 and 2025) and the start of operations.

TUP indicated that all these intersections currently operate at a Level of Service (LoS) A (i.e. good) with low vehicle delays. Modelling predicted that during the operation of the modification the performance of the Menangle/Woodbridge Road/Station Street intersection would change from Level A to Level B in 2025, which is considered "good with acceptable delays and spare capacity". The Menangle Road/Finns Road and Menangle Road/site entrance intersections would remain at LoS A operation with low vehicle delays in both morning and evening peak times, and sufficient spare capacity.

TUP noted that a large proportion of those workers that would access the site in 2025 (estimated as 308 people per day) would currently access the underground mine via Appin West, Appin East or Appin North. Similarly, a proportion of those heavy vehicles that would service the site in 2025 (estimated at 12 vehicles per day) are already servicing the Appin West, Appin East or Appin North operations. Therefore, the majority of the vehicle trips associated with the modification are already using the road network, albeit not the section of Menangle Road adjacent the Site.

TUP assessed cumulative traffic impacts which conservatively modelled intersection performance based on a 20% increase in background traffic growth for the 10 year period between 2025 and 2035. This modelling did not predict any additional changes to intersection performance beyond those presented above.

The Department accepts that traffic increases associated with the modification would be relatively minor and would allow intersections to operate at an acceptable level of performance.

Numerous public submissions on the modification raised traffic related issues as a concern, with one submission specifically questioning the impact of the increased traffic volumes on the regional road network to the south of the site. Concerns were raised about the existing constraints (including one way sections) along Wilton Road at Broughton Pass and Douglas Park Gorge on Douglas Park Drive, as well as the existing low level of operation of the Hume Highway and Picton Road intersection (refer to **Figure 2**).

The Department requested additional information on the predicted impact on these roads and intersections as a result of the proposed operational traffic volumes (refer to **Appendix A5**).

In relation to Wilton Road at Broughton Pass and Douglas Park Gorge on Douglas Park Drive, TUP confirmed that both of these roads are unsuitable for heavy vehicles and would not be utilised by these vehicles during construction or operation. However, TUP acknowledged that a small portion of workforce traffic would continue to utilise these specific regional roads to travel between Appin North, Appin West, Appin East and other facilities, and that this is consistent with the current use of these roads.

The applicant noted that existing Drivers Code of Conduct (DCOC) are currently successfully used to minimise traffic and traffic related impacts on these and other regional roads from the existing mine operations. Each DCOC is tailored to the location and includes requirements for relevant aspects such as recommended travel routes, travel times, compression breaking, speed limit, truck washing and equipment performance. The applicant has committed to preparing a site specific DCOC for the modification, with its purpose being to minimise traffic impacts associated with the modification by including preferred travel routes to ensure unsuitable traffic routes are not used by personnel, contractors and visitors attending the site.

The applicant confirmed that the DCOC would be developed as part of revisions to the existing Traffic Management Plan and would utilise the existing strategies for monitoring and management of traffic

In relation to the Hume Highway and Picton Road intersection, TUP indicated that the modification would generate an additional 1-2 vehicles per minute at this intersection during the AM peak hour between 7am and 8am. However, as the majority of these vehicles would be travelling away from the site and towards Wollongong (which is the non-peak direction), TUP confirmed that the existing LoS at the intersection (LoS B) would not change as a result of the modification. TUP also confirmed that the construction workforce trips (see below) would be outside the peak hours and not impact intersection performance.

The applicant has committed to ensure that all heavy vehicle movements associated with the operation of the site would occur during the day time only. The Department has recommended a condition to this effect.

Construction Traffic

TUP indicated that the majority of the construction workforce would typically arrive between 6:00 am – 7:00 am and depart between 6:00 pm – 7:00 pm. During each of these times, the maximum hourly traffic generation would be 76 workforce trips (inbound and outbound).

Traffic counts at intersections on the nearby road network indicated that the morning and afternoon commuter peak hours are generally 7:45-8:45 am and 4:45-5:45 pm respectively, and thus there would be little overlap between the construction workforce trips and the commuter peak hours. Accordingly, the impacts on the roads and intersections would be less than during the operational phase of the modification.

In addition, TUP indicated that during the peak construction period (6 to 8 weeks) up to 44 heavy vehicles per day could make deliveries to the site. It is proposed that delivery of concrete during the vent shaft construction would occur 24 hours, 7 days a week. Night time deliveries of concrete are likely to come from Narellan and would use Remembrance Driveway, Finns Road, Woodbridge Road and Menangle Road, to and from the north (refer to **Figure 8**). Outside the peak construction period, heavy vehicle deliveries would number 11-13 vehicles per day.

The Department accepts that proposed heavy vehicle movements during the construction period are acceptable given the short peak construction period when the largest number of heavy vehicle movements would occur. As noted in Section 6.1 above, the predicted day and night time noise levels from heavy vehicles during construction are below the *Road Noise Policy* criteria.

TUP noted that a number of Special Purpose Vehicles and Oversize Vehicles would need to deliver equipment to the site. The applicant has committed to ensuring these vehicles have the appropriate permits.

Outer Sydney Orbital Stage 1

The Outer Sydney Orbital Stage 1 (OSO1) is a corridor of land that has been identified for potential future transport infrastructure. This corridor would intersect a portion of the proposed operational area of the ventilation and access site. The exact staging of delivery of the OSO1 has not yet determined. However, TfNSW has confirmed that it is an initiative for investigation over the next 10-20 years, so may coincide with the operation of the site.

The applicant has undertaken preliminary consultation with TfNSW to establish the design parameters required for both projects to co-exist on the 345 Menangle Road site, and has proposed to continue to

work closely with TfNSW during the detailed design phase of the OSO1 and to develop a specific infrastructure management plan that would include:

- detailed design and engineering parameters required for co-existence;
- measures to ensure the ongoing safety and serviceability of the site and OSO1 during construction and operation.;
- any upgrades or augmentations required to the site associated with the construction and operation of the OSO1; and
- assessment of risks generated by co-location of surface infrastructure.

TfNSW supported the development of an infrastructure management plan and recommended that the plan be included as a condition of approval. The Department has recommended a condition accordingly.

Mitigation and Management

The applicant currently manages construction and operational traffic associated with its existing operations in accordance with an approved Traffic Management Plan. The Department notes that the existing plan would be required to be reviewed and extended to include this modification. The applicant has also committed to include a detailed site specific driver's code of conduct as part of the plan to minimise traffic impacts associated with the modification.

In addition, the Department has recommended that a site-specific construction Traffic Management Plan, as a sub-plan of the Construction Environmental Management Plan, be prepared for the construction phase of the modification which includes:

- strategies to manage construction traffic, including road closure protocols, community consultation and measures to avoid potential road safety conflicts with other road users;
- a program for conducting road safety audits, including both pre and post construction, of the intersection of the site entrance with Menangle Road;
- a vehicle movement plan for:
  - managing light, heavy and over-dimensional vehicles during construction works;
  - transporting construction waste materials; and
  - restricting construction or transportation hours to avoid road user conflicts; and
- a traffic control plan prepared in accordance with *Traffic Control at Work Sites* (RMS, 2018).

Conclusion

The Department accepts that the predicted increase in traffic associated with both the construction and operation of the site are relatively minor and would the intersections and local/regional roads are likely to continue to operate at an acceptable level of performance.

The Department is satisfied that the recommended conditions would ensure that the intersection of the proposed site entrance with Menangle Road would be designed and constructed to AustRoads standards and in consideration of road safety audits, which would contribute to enhancing the condition of the existing Menangle Road and ensure safe access to the site and operation of the road.

Subject to the existing and recommended conditions, the Department considers the modification's potential traffic impacts would be acceptable.

6.5 Visual

Noting the rural residential setting, potential visual impacts, particularly on the closest receivers R2 and R3, was a key consideration of the Department. Visual impacts were also raised in submissions.

The Modification Report included an assessment of the nature, extent and significance of the potential visual impacts of the modification to landscape character and key viewpoints surrounding the proposed site. Impacts were assessed in terms of the sensitivity of the receptors and the magnitude of proposed change.

An additional assessment of the potential visual impacts was included in the Submissions Report in response to a request from the Department. This included photomontages for the specific locations

identified as locations of concern in submissions, and the predicted effects of vegetation shielding at these locations over time.

Existing Visual Setting

An artist's impression of the site layout and design is provided in **Figure 6**. The site would be publicly visible from Menangle and Finns Roads, as well as from several nearby residences including five located along Menangle Road and one located on Finns Road. The nearest residences to the site are located directly to the north (R2) and west (R3), approximately 180 m and 280 m from the proposed operational footprint of the site, respectively (refer to **Figure 4**). Views from the Menangle township to the proposed site are highly obscured by intervening terrain.

Figure 6 | Site Layout

Visual Impacts

The Modification Report presented several visual simulations from eight viewing locations surrounding the site, comparing existing views to views at different times during the development of the facility to show the progression of visual screening. The location and direction of the viewpoint simulations are shown in **Figure 7**.

A summary of the potential impact of the modification on key viewpoints is provided in **Table 11**. The majority of the viewpoints were considered to have a negligible or low-moderate level of visual impact due to filtered views and distances to the site. However, two locations were predicted to experience high to moderate levels of visual impact, including receivers R2 (VP3) at 310 Menangle Road and R3 (VP7) at 30 Finns Road. These residences would experience direct views to the site that would constitute a significant component of their existing viewshed. A photomontage of the view from the house at 30 Finns Road to the east-south-east to the site is shown in **Figure 8**.

The Department notes that numerous public submissions raised visual impacts associated with the modification as a significant concern, including four of the household members at the 30 Finns Road residence. The submissions identified general visual amenity impacts, lighting, and the height of the headframe and winder tower (25 m) as being of specific concern.

Table 11 | Visual Impact from High Priority Viewpoints

Viewpoint	Location	Predicted Visual Impact
1	Public viewing location from Menangle/Finns Road intersection	**Moderate:** magnitude of change not significant in wider context of Menangle and Finns Roads which include other extractive/industrial and commercial/agricultural land uses. Road users would not view site for a significant amount of time.
2	Private residence at 143 Menangle Road	**Negligible:** view to site would be filtered and barely visible due to distance.
3	Private residence at 310 Menangle Road	**High-moderate:** site would constitute a significant component of the view to the south and the built form of structures would not contrast well with the surrounding landscape.
4	Private residence at 475 Menangle Road	**Negligible:** view to site would be filtered and barely visible due to distance.
5	Private residence at 485 Menangle Road	**Low-moderate**: site would only partially feature in the view to the north-north-east.
6	Private residence at 545 Menangle Road	**Low-moderate:** : site would only partially feature in the view to the north-north-east.
7	Private residence at 30 Finns Road	**High-moderate:** site would constitute a significant component of the view to the east-south-east and the built form of structures would not contrast well with the surrounding landscape.
8	Public viewing location from Menangle Road (near No. 132)	**Negligible:** view to site would be filtered and barely visible due to distance.

Figure 7 | High Priority Viewpoints – Location and Direction

Figure 8 | Photomontage of site from VP7 (30 Finns Road)

Mitigation Measures

The applicant has committed to implementing a range of mitigation and management measures to minimise the adverse visual impacts associated with the modification, including:

- using an overall colour of predominantly green and grey tones for the tallest and most visible infrastructure and building components at the site to reduce the visual contrast of the infrastructure with the surrounding landscape;
- minimising the use of highly reflective materials on infrastructure and building components;
- establishing visual bunds at key locations around the operational footprint;
- planting screening vegetation along the site boundary and at the residences predicted to experience moderate to high visual impacts (VP3: 310 Menangle Road and VP7: 30 Finns Road) to filter and shield the views of the site from the residences; and
- installing and operating outdoor lighting in accordance with *Australian Standard 4282-2019: Control of the obtrusive effects of outdoor lighting*.

The applicant has confirmed that screen tree planting in targeted areas along the site boundary adjacent to Menangle Road has commenced. The company has entered into an agreement with the property owners at 310 Menangle Road and commenced consultation with the owners of 30 Finns Road in relation to various options for screen tree planting, and the applicant has confirmed that it has already planted hedging plants at 30 Finns Road. A series of photomontages based on vegetation growth rates were including in the Submissions Report, indicating that in approximately 3-5 years the hedges would be around 1.2 m in height and likely to partially screen the site from the main viewpoints at the rear of the dwelling (**Figure 9**).

The applicant committed to continue to consult with the residences of the most impacted properties to agree on the locations of further plantings, tree species and ongoing maintenance requirements.

Figure 9 | Photomontage of site from VP7 (30 Finns Road) 3-5 Years after planting hedge and boundary trees

Figure 10 is a photomontage of the expected view towards the site by road users at the intersection of

Figure 10 | Photomontage of site from the intersection of Finns Road and Menangle Road 3-Years after screen planting

Representatives from the Department undertook an inspection of the tree planting completed to date at the property at 30 Finns Road. It was noted that several of the screen trees had died and the remainder did not appear to be establishing particularly well. The Department therefore considers it important that a more dedicated effort be made to establish a vegetation screen able to minimise the significant views of the site from this property in the medium to long term.

The Department acknowledges that it is likely that these properties would continue to be impacted in the short to medium term as the vegetation grows. However, the Department considers that with planting and dedicated maintenance of screen trees, visual impacts could be significantly reduced in the longer term.

The Department notes that the existing conditions of approval require the applicant to minimise visual and lighting impacts associated with ancillary surface works, and that this condition would also apply to the modification. However, the Department has also recommended specific conditions requiring:

- the visual appearance of the buildings, structures, facilities or works (including paint colours and specifications) at the site to blend as far as possible with the surrounding landscape; and
- implementation of site-specific landscaping strategies on the site and at the privately owned residences at 310 Menangle Road and 30 Finns Road, Menangle to minimise the visual impacts of the ventilation and access site, including:
  - notification and consultation with affected residents and Council;
  - carrying out further screen tree planting at the residences; and
  - implementing a maintenance schedule for the planted trees over the life of the site.

Conclusion

The Department supports the proposed visual mitigation and management measures proposed by the applicant, however acknowledges that several residences would still experience high to moderate adverse visual impacts, particularly in the short to medium term. The Department has recommended a specific condition requiring screen tree planting at the most impacted residences and considers this would reduce impacts to acceptable levels in the longer term.

6.6 Other Issues

The Department is satisfied that other impacts associated with the proposed modification would not significantly increase from the approved project. The Department has summarised its assessment of a range of other matters in **Table 12** below.

Table 12 | Other Issues

Issue	Findings and Recommendation
Site Alternatives	• Representations on the modification expressed concerns that there was insufficient information provided in the Modification Report or the Submissions Report on the consideration of alternative locations for the mine ventilation and access site, and recommended a site to the east of the Hume Highway near the Partridge VC Rest area. • The Department subsequently requested further information on the alternative site options analysis undertaken as part of the prefeasibility study for the modification and consideration of the proposed alternative site. • Additional information provided by the applicant (refer to **Appendix A5**) confirmed that site location is constrained due to the current and future mine geometry, local geology and surface constraints. • For safety reasons, shafts cannot be located directly above an active or proposed longwall. To avoid sterilisation of coal it is preferable to locate shafts above mains, which are designed to deliver mine ventilation air and personnel to the active mining environment (and facilitate return air delivery to the upcast shaft). The presence of the Wandinong Fault, which runs immediately to the north of the site, has dictated the location of the underground mining mains, which in turn influences the shaft location. • Surface constraints include existing land use and ownership, proximity of services, surrounding land uses (including proximity of residents), site accessibility and impacts to environment and cultural features. • The modification is located directly over the approved Simpsons Mains which supports Appin Area 7 mining. An added benefit of this site location is that it is positioned far enough to the

Issue	Findings and Recommendation
	north east of the approved workings to provide ventilation and access for future approved mining in that direction. • The proposed site is located within a rural setting, with the closest residence approximately 413 m from the proposed VS7. The land is predominantly cleared, devoid of high value native vegetation or heritage sites, and removed from significant watercourses. The applicant intends to provide required services to/at the site and upgrade the site access. • In relation to other specific alternative site locations, the applicant confirmed: - the site can no longer viably be located at the existing Ventilation Shaft No. 6 site due to the mine plan change from a dual longwall operation to a single longwall operation which meant that the main roadways immediately to the west of LW709 no longer extends to the northwest between Area 7 and Area 9; - the site to the east of the Hume Highway near the Partridge VC Rest Area is unsuitable as it is located directly above the approved extraction area of LW708B, it overlaps with multiple lots, and it is within proximity to several potential receivers on surrounding lots. • On this basis, the applicant concluded that of the available land, the proposed site is the optimal location. • The Department notes that proponents are not required to fully assess every available site as part of their feasibility processes, rather proponents are required to consider viable options based on land availability and constraints. The Department accepts that the applicant has given due consideration to alternative site locations and acknowledges that there is a narrow corridor of viable site locations given both underground and surface constraints. The Department has carefully considered the suitability of the proposed site as part of its assessment of this modification.
Biodiversity	• The Modification Report included a Biodiversity Development Assessment Report (BDAR) that was prepared by Niche Environment and Heritage Pty Ltd (Niche) in accordance with the Biodiversity Assessment Method (BAM). The BDAR assessed potential impacts associated with the modification on both terrestrial and aquatic biodiversity. • BCS considered the BDAR adequate except for the targeted survey for the endangered Spike Rice-flower (*Pimelea spicate*). BCS recommended surveys for this species be undertaken in all the PCT 849 identified on site (grassland, shrubland and woodland), or alternatively that an expert report be provided stating that the species is unlikely to occur within the PCT 849 areas. • Additional surveys for the Spike Rice-flower were subsequently undertaken across the site by Niche in September and November 2021 and no Spike Rice-flower individuals were observed at the site. Therefore, Niche concluded that the modification would not impact this species. • Council requested that surveys also be undertaken for the endangered Cumberland Plain Land Snail (*Meridolum corneovirens*), despite the fact that Niche considered the site to be too degraded and devoid of trees to support habitat for this snail. • No Cumberland Plain Land Snail were identified during additional surveys for the species, and Niche concluded that the modification would not impact this species. • Council also requested that the updated BMP include mapping of identified areas of Derived Native Grasslands (DNG) and PCT 835 on the site and adjacent creek line. The applicant committed to include this information as part of the updated BMP (see below). • Niche confirmed that the site layout has been designed to avoid the better quality stands of Cumberland Plain Woodland (CPW) present in the south, south-east and north-east of the site, with disturbance areas predominantly comprising CPW grassland with a high proportion of weeds. Niche concluded that the modification is therefore unlikely to cause a serious and irreversible impact (SAII) on existing CPW. • The proposed modification would directly impact 0.44 ha of PCT 835 (*Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion)* and 18.34 ha of PCT 849 (*Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion),* which align with threatened ecological communities (TECs) under both the BC Act and the EPBC Act. • However, Niche identified that the vegetation is highly modified, the PCT 835 does not have a native tree layer and therefore it would not satisfy the condition thresholds of the BC Act or the EPBC Act, and that the minimum foliage cover and patch size of the PCT 849 would not meet the EPBC Act thresholds, although it would constitute a TEC under the BC Act. • Notwithstanding that, two ecosystem credits are required for clearing of 0.13 ha of the woodland and scrubland components of PCT 849 (no credits are required for clearing of the remaining 18.21 ha of PCT 849 grassland due to the low condition score). • No threatened fauna species were recorded or expected to occur on the site. • In relation to aquatic biodiversity, Niche confirmed that the Foot Onslow Creek channel which runs along the eastern boundary of the site, was reasonably well vegetated by mostly exotic trees and a mixed native/exotic groundcover, with riparian vegetation being in good health.

Issue	Findings and Recommendation

	Niche concluded that while it is likely to provide some aquatic habitat (including some macrophytes) for tolerant aquatic fauna, it is unlikely to support sensitive species protected under State and Federal legislation. Foot Onslow Creek is not mapped as being key fish habitat.
	• The applicant has committed to implementing a range of mitigation and management measures to minimise impacts to biodiversity, including delineation of disturbance areas; implementation of erosion and sediment controls; and pest and weed prevention measures. In addition, in line with recommendations from Council, the applicant has committed to updating the existing Biodiversity Management Plan to incorporate the modification.
	• The Department accepts that the modification has been designed to avoid, mitigate and manage biodiversity impacts where practicable, and that the residual impacts can be adequately offset.
	Recommendations
	• The Department has recommended a conditions requiring the applicant to:
	  ○ update and review the existing Biodiversity Management Plan to specify site-specific biodiversity mapping, monitoring, management and offsetting measures for the Appin ventilation and access site; and
	  ○ offset the residual biodiversity impacts of the modification via the retirement of ecosystem credits, in accordance with the Biodiversity Offsets Scheme of the BC Act.

Surface Water	• Foot Onslow Creek is the primary water body near the site. It is a 3rd order stream that flows in a northerly direction along the eastern boundary of the site (**Figure 4**). Two unnamed 1st order ephemeral drainage lines flow through the site via a series of small dams before draining into Foot Onslow Creek. • Potential surface water impacts could occur during construction as a result of erosion and sedimentation from surface disturbance. During operations, runoff from the sewerage treatment irrigation spray field has the potential to impact water quality. • The applicant has committed to manage potential surface water impacts in accordance with the existing Surface Water Management Plan (SWMP), which would be updated to incorporate site-specific mitigation and management measures during construction and operation. These measures include constructing drains to divert clean water around the site; a sediment pond to treat dirty water prior to discharge (subject to an EPL variation); erosion and sedimentation controls; and effluent management from the spray irrigation fields. • Council and a representation on the modification raised concerns about the adequacy of the areas proposed for the spray irrigation given the predicted volumes and types of effluent proposed to be generated at the site, and the potential impacts of runoff into Foot Onslow Creek. Council recommended that a detailed wastewater assessment be undertaken to provide details of the proposed sewerage treatment and disposal facilities. • Additional information provided by the applicant (see **Appendix A**) identified that the proposed irrigation areas are located at the southern portion of the site (refer to **Figure 3**) and are adequate to manage proposed effluent volumes during operation and comply with relevant buffer zone guidelines from sensitive features such as creeks. The applicant committed to complete long-term daily water, nutrient and salt balance modelling for the irrigation system as part of the detailed design phase of the modification. • The Department notes that the proposed irrigation would occur in accordance with an EPL that would set out conditions for the activity. Under Section 68 of the *Local Government Act 1993*, Council is also required to approve on-site waste water systems to ensure appropriate waste disposal/ management. • During construction, temporary ablution facilities would be utilised and a licensed waste removal contractor would remove and dispose of waste water / effluent at a licensed discharge facility as required. *Recommendations:* • The Department has recommended that the updated SWMP include specific measures to manage effluent from the STP spray irrigation fields at the site. • Subject to the existing and recommended conditions, the Department considers that the potential impacts of the modification on surface waters are acceptable.
Groundwater	• In response to a request from Council and the Department, the applicant provided additional information and modelling of the potential impacts of the modification on groundwater resources, including quantification of groundwater 'take' as a result of the shaft sinking operations and predicted impact on local groundwater resources, including bores and farm dams. This information was provided in a Groundwater Assessment prepared by HGEO Pty Ltd (HGEO) (**Appendix A5**). • The groundwater regime for the Project area comprises a perched groundwater system associated with the Wianamata Group, which is disconnected from the underlying shallow groundwater system within the saturated Hawkesbury Sandstone. The groundwater system

Issue	Findings and Recommendation
	within the Hawkesbury Sandstone contains the highest yielding groundwater supply bores in the area. The underlying deeper groundwater system within the Narrabeen Group and Illawarra Coal measures are affected by underground mining and coal seam depressurisation. • HGEO indicated that there are 25 registered bores within the modification area which extract groundwater from the Hawkesbury Sandstone and are predominantly used for stock and domestic purposes. The area also includes numerous farm dams located in gullies, small streams and overlying flow paths which are used for stock and domestic purposes. There are no headland swamps in the vicinity of the modification area. • Groundwater modelling indicated that the modification may involve the incidental 'take' or diversion of groundwater during construction and ongoing use of the ventilation shafts. During construction, HGEO estimated that total groundwater inflow to the two shafts would be approximately 30.4 megalitres (ML) in 2023 and 59.8 ML in 2024. • To ensure shaft sinking efficiency and minimise impacts on localised groundwater resources, the applicant has committed to implementing mitigation measures for reducing and controlling groundwater inflow into the shafts. Proposed measures include targeted grouting of fracture zones and high permeability horizons, and progressive pouring of a concrete lining closely behind the working area during excavation of the shafts. With increased controls, HGEO predicted that actual inflows may be lower than those predicted. • HGEO predicted that during operation of the shafts, groundwater inflow would decline significantly because the shafts will be fully lined and geological units will be depressurised due to mining. Based on observed predictions at Appin Mine and other mines in the Southern Coalfields, HGEO estimated that the combined long-term water take for the two shafts would be no greater than 0.14 ML/year. • Based on these inflow rates, modelling predicted that drawdown due to the modification would be negligible at most registered bores within the modelled area. Minor drawdown is predicted at stock and domestic bore GW105574 (0.85 m), domestic bore GW106574 (0.80 m) and test bore GW108990 (1.47 m). • HGEO predicted negligible impacts to farm dams as the dams in the modification area are shallow and effectively perched within the upper weathered horizons of the Wianamatta Group. Further, HGEO confirmed that drawdown is not predicted at the Nepean River during construction or operation of the shafts. • The Department accepts the groundwater drawdowns associated with the modification are predicted to be minor, and unlikely to significantly impact local groundwater users. The Department notes that the existing conditions of approval require the applicant to provide a compensatory water supply to any owner of privately-owned land whose water supply is adversely impacted (other than an impact that is negligible) as a result of the project, and that this requirement will also apply to any impacts as a result of the modification. • The applicant has confirmed that its existing Water Access Licences (totalling 877 ML/year) are sufficient to account for the predicted incidental groundwater take associated with the modification. *Recommendation:* • HGEO recommended that groundwater monitoring be undertaken during construction at the existing bore (S2524) located between V7 and V8 in order to compare modelled and actual groundwater depressurisation as a result of the modification, and confirm impacts to groundwater resources. The Department has recommended a condition requiring the applicant to monitor and manage groundwater inflows and impacts to groundwater resources as a result of shaft construction activities at the site as a component of the Construction Environmental Management Plan. • Subject to the existing and recommended conditions, the Department considers that the potential impacts of the modification on groundwater resources are acceptable.
Aboriginal Heritage	• The Modification Report included an Aboriginal Cultural Heritage Assessment (ACHA) that was prepared by Niche. • Heritage NSW acknowledged that extensive field assessment and consultation with the local Aboriginal community had taken place to inform the ACHA and the support that RAPs involved in the modification had provided. • The ACHA completed for the original BSOP in 2009 recorded one isolated artefact (AHIMS ID#52-2-3687) located on the site and an open camp site (AHIMS ID#52-2-3688) located approximately 100 m along a fence on the eastern side of Foot Onslow Creek. • Searches of the relevant heritage databases did not identify any additional Aboriginal heritage items on the site or immediate surrounds. • Extensive field surveys and test pit excavations completed by Niche confirmed the AHIMS ID#52-2-3687 site is a low-density open camp site that extends from the eastern side of the site across the banks of Foot Onslow Creek. The site was assessed to hold low scientific (archaeological) significance. Part of the site would be directly impacted as a result of the modification.

Issue	Findings and Recommendation
	• Niche confirmed that site AHIMS ID#52-2-3688 would not be impacted by the modification. • Overall, Niche concluded that the results demonstrated the site was likely associated with a low intensity occupation and use by Aboriginal people. The broad association between artefact bearing test pits, the locations of sites AHIMS ID #52-2-3687 and AHIMS ID#52-2-3688 and the low number of subsurface artefacts suggest that Aboriginal objects resulted not from isolated behavioural events but from sporadic use of and/or movement through the Site over a long period. • The applicant has committed to update the Heritage Management Plan (HMP) in consultation with the RAPs to include site-specific Aboriginal heritage management measures, including collection of surface artefacts at site AHIMS ID#52-2-3687. • The Department recognises that the modification would directly impact one Aboriginal heritage site, but considers that this impact can be appropriately managed and mitigated subject to existing conditions.
Historic Heritage	• No listed historic heritage items nor undiscovered heritage items were identified on the site or in the immediate surrounds, and the site does not meet the criteria for local or State heritage significance. • The approved Heritage Management Plan includes an unexpected finds protocol, which would ensure any currently undiscovered heritage items, if any exist, are managed appropriately. • The Department considers that any impacts to historic heritage items can be appropriately managed and mitigated subject to existing conditions.
Greenhouse Gases	• The air quality assessment prepared by EMM included a GHG assessment which predicted GHG emissions associated with the modification with reference to the *National Greenhouse Gas Inventory for 2018* (DEE, 2018). • EMM indicated that Scope 1 and 2 GHG emissions would be generated during construction by the on-site combustion of diesel, stripping of vegetation, electricity use and use of explosives. Construction emissions are predicted to be 3,830 t CO2-e (Scope 1) and 7,683 t CO2-e (Scope 2), which annually is equivalent to 0.007% of NSW emissions and 0.002% of Australian emissions. • EMM indicated that Scope 2 GHG emissions would be generated during operations by electricity generation for the fans and pit top infrastructure. Operations emissions would be approximately 45,538 t CO2-e, which annually is equivalent to 0.008% of NSW emissions and 0.003% of Australian emissions. • EMM noted that the operation of the proposed surface fans would remove the dependency on two existing underground booster fans which currently consume more electricity. The proposed surface fans at VS8 would therefore reduce overall electricity consumption for the mine. • The applicant committed to continue to implement the GHG mitigation and management measures specified in the existing Air Quality and Greenhouse Gas Management Plan for the site. • Council requested an independent specialist advice on the calculated GHG emissions. Given the very low percentage contribution of GHG emissions associated with the modification in the State and Commonwealth contexts, and the fact the overall electricity consumption would be reduced as a result of the modification, the Department does not consider further specialist advice is warranted. • The Department considers that GHG emissions can be appropriately minimised, managed and mitigated subject to existing conditions.
Social	• Extensive community consultation was undertaken as part of the assessment process. As discussed in Section 4.2 above, key concerns raised in public submissions were in relation to amenity impacts, including visual, noise, air quality, traffic, lighting and property impacts, and the negative impacts (anxiety and stress) this may have on the quality of life for local residents. • The Department carefully considered these potential social impacts in its assessment of the modification. The Department acknowledges that people may experience these impacts differently and that there would likely be some residual amenity impacts to the community from the construction and operation of the site. However, the Department considers that the specialist assessments and additional information provided by Proponent demonstrates that the site can operate within the relevant criteria, or else mitigation and management strategies are proposed that would reduce the impact to acceptable levels set under NSW Government policy. The Department considers that the existing and proposed suite of comprehensive and precautionary conditions would ensure this is the case. • The applicant confirmed that it has prepared a detailed Communication and Stakeholder Engagement Strategy for the modification to guide activities associated with stakeholder engagement and management. In accordance with a recommendation from Council, the

Issue	Findings and Recommendation
	applicant has committed to review and update this strategy regularly during the construction and operational phases of the modification to ensure effective, relevant and timely input from stakeholders and the community. The Department supports this commitment. • Numerous public submissions noted the potential impacts on local land values as a concern, and the need to compensate local land owners for reduced property values. In relation to concerns over property values, the Department notes that the NSW Land and Environment Court has consistently held that concerns regarding property devaluation can be given little weight in the absence of supporting evidence, and the EP&A Act does not provide any compensation mechanism for development which is permissible under relevant planning controls.
Rehabilitation	• The applicant committed to extending the existing mine overarching rehabilitation, remediation and closure objectives to the site, including providing: o safe landforms suitable for future land uses as agreed with relevant stakeholders; o landforms that are stable in the long term without significant additional management being required post-relinquishment; o no unacceptable impacts to people and the environment through pollution or other changes to environmental factors; and o a positive legacy for the community post-closure. • The applicant indicated that a final land use of rural and/or residential use, consistent with current and surrounding land use, is proposed for the site. However, the applicant committed to review the proposed final land uses over the mine life in consultation with government and the relevant stakeholders. • The Department notes that the existing project approval contains numerous conditions relating to rehabilitation, including requirements for progressive rehabilitation; rehabilitation objectives for vent shafts requiring retention of habitat for threatened species; and the preparation and implementation of a rehabilitation management plan. These conditions would continue to apply to Appin ventilation and access site, and the rehabilitation management plan would be required to be reviewed and updated to include site-specific rehabilitation measures. *Recommendation:* • In order to align the existing rehabilitation conditions with the most recent statutory requirements, the Department has recommended that existing conditions be amended to require: o The applicant to rehabilitate the site in accordance with the conditions imposed on the mining leases(s) associated with the development under the *Mining Act 1992* (Schedule 4, condition 31); and o the rehabilitation management plan to be prepared and implemented in accordance with the conditions imposed on the mining leases(s) associated with the development under the *Mining Act 1992* (Schedule 4, Condition 33).

6.7 Administrative Amendments to Project Approval

As discussed in Section 2.1, the applicant is seeking approval to amend several conditions of the existing project approval. The proposed amendments are primarily to correct number referencing and to contemporise specific conditions of approval. **Table 13** provides a summary of the proposed amendments and the Departments consideration of each. The Department has generally accepted that the proposed amendments are necessary and has recommended they be adopted as part of this modification.

Table 13 | Consideration of Proposed Amendments to Project Approval

Current Condition	Proposed Amendment	Department Consideration
Extraction Plan Schedule 3, Condition 5(k)	Incorrect reference to conditions 24 in last dot point. Should be condition 25.	Accept
Air Quality Acquisition Criteria Schedule 4, Condition 10	Incorrect reference to Condition 6 in first paragraph. Should be conditions 2 – 5 of Schedule 5.	Accept
Surface Water Discharges Schedule 4, Condition 14	Delete condition ensuring all surface water discharges comply with any EPL.	The existing condition requiring compliance with the EPL is a standard condition. Recommend that the condition

Current Condition	Proposed Amendment	Department Consideration
		be retained in the existing project approval.
Environmental Management Strategy (EMS) Schedule 6, Condition 1	Delete part (f) first dot point requiring copies of any strategies, plans and programs approved under the conditions of this approval to be included in the EMS.	Accept and recommend that the condition be reworded to include “references to all relevant” strategies, plans and programs approved under the conditions of this approval be included in the EMS.
Key Surface Facilities Appendix 4	Replace figure in Appendix 4 with Figure 1 of the PPR Supplementary Information to more accurately depict the footprint of the Stage 4 Coal Wash Emplacement.	Accept.

7 Evaluation

The Department has assessed the merits of the proposed modification and considered its potential environmental, social and economic impacts and the relevant requirements of the EP&A Act.

The Department recognises that the modification proposal is necessary to provide the required ventilation infrastructure and mine access to ensure a safe and efficient underground working environment and support the ongoing operation of the mine. Further, the development of the mine access facility would reduce underground travel times and therefore improve production efficiency.

The Department accepts that the applicant has given due consideration to alternative site locations, and acknowledges that there is a narrow corridor of viable site locations given both underground and surface constraints.

The Department also acknowledges that the new mine ventilation and access site is proposed to be placed in a rural/ rural residential area and that it would introduce amenity impacts to nearby residences including noise, blasting, air and visual impacts, along with increased traffic along Menangle Road and into the site.

The Department's assessment indicates that construction of the proposed ventilation and access facilities has the potential to result in adverse noise impacts on surrounding residents over the extended construction period (up to 3 years). However, implementation of a range of mitigation and management measures, including restricting construction hours and establishing acoustic barriers and acoustic sheds, would result in compliance with strict noise criteria. Once operational, the noise levels generated at the site would remain below relevant noise criteria.

The blast assessment demonstrates that, with the implementation of a range of blast design controls and mitigation measures (blast mats, water curtains and sheds), compliance with applicable criteria can be achieved during day time shaft construction activities. However, the Department has recommended that blasting be restricted to standard hours until such time that it can be demonstrated that compliance with strict sleep disturbance criteria can be achieved. This would ensure blasting would not cause annoyance or sleep disturbance for surrounding residences in the evening or night time periods.

Air emissions are predicted to comply with all relevant air quality standards and independent expert advice has confirmed that the modification is unlikely to cause any adverse air quality impacts. Accordingly, the Department considers that the air impacts would be acceptable. However it has recommended conditions requiring ongoing monitoring of ambient air quality around the site, along with monitoring of discharges from the upcast shaft.

The visual assessment indicates that two residential receivers with direct views to the site may experience adverse visual impacts in the short to medium term. The establishment of visual bunds at the site and planting of screening vegetation along the site boundary and at the impacted residences would filter and shield the views of the site in the longer term.

Similarly, subject to the existing and recommended conditions, the Department considers the modification's potential impacts on traffic, biodiversity, water resources and Aboriginal heritage would be acceptable.

The Department also notes the unique nature of this hard coking coal resource within NSW makes it a very important contributor to the local, regional and State economies. The proximity of the Southern Coalfield to the coast and the Port Kembla Coal Terminal is a major factor supporting export of coal from the region. Coal from the Southern Coalfields also supports local industry, such as BlueScope Steelworks at Port Kembla which employs around 3,000 people.

The Department therefore considers the mine ventilation and mine access facilities both economically and socially important for the State and the Illawarra region, to allow the continuation of safe and efficient mining at the BSOP in the short to medium term.

The modification would also ensure the continued direct employment of 1,800 people during operation and an additional 74 people during construction. The majority of IMC's employees reside within the

Illawarra Region, with subsequent benefits for the regional economy. The modification would result in the continued engagement of local suppliers and businesses providing products and services to the mine. In the 2020 financial year, approximately $237 million was spent with local vendors. Over the life of the mine, it is estimated that contributions of approximately $2 billion in royalties and $205 million in employee and contractor payroll tax would be made to the State of NSW.

On balance, the Department is satisfied that the proposed modification can be carried out in an environmentally sustainable manner, and that the proposal is in the public interest as it would allow the continued operation of the mine and the associated employment and economic benefits to be realised. Accordingly, the Department considers that the modification can be approved.

The Department has drafted a recommended Notice of Modification (see **Appendix C**) and consolidated version of the project approval, as modified (see **Appendix D**).

8 Recommendation

It is recommended that the Director, Resource Assessments, as delegate of the Minister for Planning:

- **considers** the findings and recommendations of this report;
- **determines** that the modification application 08_0150 MOD3 falls within the scope of section 4.55(2) of the EP&A Act;
- **accepts and adopts** all of the findings and recommendations in this report as the reasons for making the decision to grant approval to the modification application;
- **agrees to modify** the project approval for the Bulli Seam Operations Project (08_0150); and
- **signs** the attached Notice of Modification (**Appendix C**).

Recommended by:

04/04/2022

Rose-Anne Hawkeswood
Team Leader
Resource Assessments

Appendices

Appendix A – List of Documents

A1 – Modification Report: Refer to “Modification Report” folder on the Department’s website at: https://www.planningportal.nsw.gov.au/major-projects/project/40511

A2 – Submissions: Refer to “Submissions” folder on the Department’s website at: https://www.planningportal.nsw.gov.au/major-projects/project/40511

A3 – Agency Advice: Refer to “Agency Advice” folder on the Department’s website at: https://www.planningportal.nsw.gov.au/major-projects/project/40511

A4 – Submissions Report: Refer to “Response to Submissions” folder on the Department’s website at: https://www.planningportal.nsw.gov.au/major-projects/project/40511

A5 – Additional Information from Proponent: Refer to “Additional Information” folder on the Department’s website at: https://www.planningportal.nsw.gov.au/major-projects/project/40511

A6 – Independent Expert Review of Air Quality Assessment: Refer to “Additional Information” folder on the Department’s website at: https://www.planningportal.nsw.gov.au/major-projects/project/40511

Appendix B – Consideration of Objects of the Act

Table B1 | Consideration of the proposal against relevant objects of the EP&A Act

Objects of the EP&A Act		Consideration
(a)	*to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources*;	The modification meets this object because it would provide the required ventilation infrastructure and mine access to ensure a safe and efficient underground working environment to support the ongoing operation of the approved mine, while utilising the mine's established workforce. While the modification has the potential to negatively impact neighbouring residences in the short term (construction noise, blasting and visual impacts), the Department considers that temporary negative impacts can be managed under recommended conditions.
(b)	*to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment*;	The Department's assessment has sought to integrate all significant environmental, social and economic considerations. The Department considers that the modification can be carried out in a manner that is consistent with the principles of ecologically sustainable development.
(c)	*to promote the orderly and economic use and development of land*;	The site was historically used as grazing land, however is currently not used and considered low capability agricultural land (classes 5 and 6). The proposed surface facilities would require minimal clearing of native vegetation. The site is located directly above the approved main underground mine roadway workings associated with Appin Area 7, therefore allowing direct connection within underground working for the required mine ventilation and access. The modification is permissible on the land pursuant to the Mining SEPP. The modification would allow ongoing operation of the mine, therefore ensuring continued direct employment of 1,800 people, continued engagement of local suppliers and businesses (A$237M spent in 2020) and provision of substantial royalties (A$2 billion) to the State. The Department considers this represents an orderly and economic use of the land.
(e)	*to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats*;	The Department has assessed the biodiversity impacts of the modification in accordance with relevant State and Commonwealth legislation, policies and guidelines. The proposed site is primarily cleared land. The modification would avoid impacts on threatened biodiversity, however would require clearing of small patches of EEC. The Department has recommended conditions to ensure that the residual biodiversity impacts of the modification would be appropriately managed and offset.
(f)	*to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage)*;	The Department has assessed the likely impacts of the modification on Aboriginal cultural heritage and historic heritage. The Department recognises that the modification would partially impact a single Aboriginal cultural heritage site, however is unlikely to impact any historic heritage sites. The Department considers that impact to the Aboriginal heritage site can be appropriately managed and mitigated subject to the recommended conditions.
(i)	*to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State; and*	The Department has assessed the modification application in consultation with Wollondilly Shire Council (Council) and other relevant NSW government authorities, and given consideration to the issues raised by these agencies in its assessment.
(j)	*to provide increased opportunity for community participation in environmental planning and assessment*.	The Department publicly exhibited the modification application and considered all submissions in its assessment.

Appendix C – Notice of Modification

See the Department's website at:

https://www.planningportal.nsw.gov.au/major-projects/project/40511

Appendix D – Consolidated Consent

See the Department's website at:

https://www.planningportal.nsw.gov.au/major-projects/project/40511