Statement of reasons for decision

New South Wales Government
Independent Planning Commission

Tahmoor South Coal Project
SSD-8445

Statement of Reasons for Decision

Professor Richard Mackay AM (Chair)
Professor Chris Fell AO

23 April 2021

Independent Planning Commission NSW
Level 3, 201 Elizabeth St Sydney NSW Australia
Telephone: (02) 9383 2100
Email: ipcn@ipcn.nsw.gov.au
ABN: 38755709681

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The State significant development Application SSD8445 for the extension of the Tahmoor Coal Mine was referred to the Independent Planning Commission by the Department of Planning, Industry and Environment on 18 December 2020. The referral followed a request from the Minister for Planning and Public Spaces for the Commission to conduct a public hearing into the carrying out of the Project prior to its determination. The Application was previously referred to the Commission on 7 June 2019 but was returned to the Department to allow it to consider amendments to the Project proposed by the Applicant.

Commissioners Professor Richard Mackay AM and Professor Chris Fell AO were appointed to determine the Application. The Applicant, Tahmoor Coal Pty Ltd, is a subsidiary of SIMEC Mining. The Applicant is seeking development consent to extend mining to a single new underground domain which would comprise 12 longwall panels located to the south of its current operations. Access to the underground workings would continue to be from the existing pit-top site and existing surface infrastructure would remain in use, including the coal handling and processing plant (with upgrades) and further use of the existing reject emplacement area. Two new ventilation shafts and a new power line are proposed.

Following a two-year construction period, approximately 33-million tonnes of run-of-mine coal would be extracted over 10 years. Product coal, comprising 90-95% metallurgical (coking) coal and 5-10% thermal coal, would be sold to domestic and international markets. The existing railway would be used to transport that coal, primarily to the Port Kembla Coal Terminal for onward shipping.

The Application was submitted to the Department of Planning, Industry and Environment in January 2019. The Department exhibited the EIS and consulted relevant government agencies in relation to the EIS and subsequent project amendments. The Department concluded that, on balance, the significant economic and social benefits of the project outweigh its potential impacts, and that the project is approvable subject to the Department's recommended conditions.

The Commission's determination process included a site and locality inspection and meetings with the Department, Applicant, Wollondilly Shire Council, Wingecarribee Shire Council and the NSW Environment Protection Authority. The Commission also held a three-day public hearing which was livestreamed on the Commission's website. All meeting and hearing transcripts and presentations, as well as site inspection notes and photographs are publicly available on the Commission's website. The Commission invited written submissions from 18 December 2020 to 24 February 2021 and received 1853 responses, made up of 1415 in support, 406 objecting, and 32 offering comment.

The Commission reopened submissions from 12 April 2021 to 20 April 2021 in response to additional information received from the Department and the Applicant concerning the Project's greenhouse gas (GHG) emissions. The Commission received a further 62 written submissions, with 11 in support, 50 objecting, and 1 neither supporting nor objecting but offering comment.

Material considered by the Commission included the Application, the findings of the Department's whole-of-government assessment, as incorporated in its Assessment Report; transcripts of meetings; written submissions; and presentations at the public hearing.

Significant concerns were raised in submissions to the Commission relating to a number of key issues, including subsidence, surface water, groundwater, biodiversity, air quality, noise, Aboriginal cultural heritage, historic cultural heritage, visual amenity, traffic, social impacts, human health, mine closure and rehabilitation, GHG emissions and the economic modelling used to assess the Project.

The Commission also received many submissions in support of the Project that focused on the economic benefits of the development, including to employees, suppliers and local businesses as well as broader impacts on the regional and national economies. While some uncertainty surrounds the accuracy of the Applicant's calculated net present value, the Project is still expected to have a positive economic impact.

The Commission accepts there will continue to be demand for coking coal over the projected life of the mine and that there are significant environmental, social and economic benefits arising from extending the life of an existing mine that has established infrastructure and an existing environmental footprint, rather than developing a completely new mine.

The Commission has weighed the impacts of the Project's GHG intensity and the total projected GHG emissions of the Project against its benefits, including the use of existing surface infrastructure and its economic benefits. Subject to the conditions of consent, including a requirement for ongoing investigation and implementation of measures to reduce GHG emissions, the Commission found that the GHG emissions of the Project are acceptable.

A key concern raised in submissions and at the public hearing was the impact of subsidence on residences and the associated disruption and stress caused to residents, particularly for those whose properties are at risk of protracted impacts from multiple longwalls. The Commission has reduced the severity and longevity of potential subsidence impacts through conditions of consent which enable access to appropriate restitution.

The Commission considered that the potential impact on the Dog Trap Creek watercourse warrants shortening of two proposed longwalls (103B and 104B), but accepted that a future amendment to enable extension of these longwalls might be considered if sufficient environmental data and environmental protection safeguards are available to demonstrate that any residual impacts will be acceptable. The Commission also accepted advice from the Applicant that re-location of a proposed mine vent shaft is possible, enabling a reduction in required clearing of a critically endangered ecological community. Changes to longwalls 103B and 104B and the vent shaft have also reduced the potential impacts on known Aboriginal sites.

The Commission noted that subsidence would extend beneath the State Heritage Register listed Wirrimbirra Sanctuary but accepted that potential impacts on the Sanctuary and other historic heritage items can be appropriately managed through conditions of consent.

The Commission considered potential impacts on the water levels of Thirlmere Lakes, which are located within the Thirlmere Lakes National Park and part of the Greater Blue Mountains World Heritage Area. The Commission has included conditions requiring updated information to be considered and acted upon by the Applicant, through a process of monitoring and adaptive management as part of a broader groundwater management process.

The Commission considered that compliance with relevant ANZECC water quality guidelines and the establishment of a new treatment plant would provide a satisfactory outcome for wastewater.

The Commission was mindful of the potential noise and air quality impacts and has addressed these through a range of conditions requiring community consultation, monitoring and adaptive responses.

The Commission has imposed conditions of consent requiring the avoidance, minimising, or offsetting of adverse environmental impacts, setting standards and performance measures for acceptable environmental performance, requiring avoidance or compensation for impacts to infrastructure and property, regular monitoring, transparent reporting and adaptive responses, and providing for the ongoing environmental management of the development.

Based on its careful consideration of the Material - and particularly of the identified key issues - the Commission has approved the Application subject to strict conditions.

DEFINED TERMS

ABBREVIATION	DEFINITION
ACHA	Aboriginal Cultural Heritage Assessment
Applicant	Tahmoor Coal Pty Ltd
Application	SSD 8445
BWMC	Bargo Waste Management Centre
BCS	Biodiversity Conservation and Science Division of the NSW Environment, Energy and Science cluster within the Department
CEEC	Critically Endangered Ecological Community
CCL	Consolidated Coal Lease
CIV	Capital Investment Value
Commission	Independent Planning Commission of NSW
Department	Department of Planning, Industry and Environment
DPIE-Water	Water Group, Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPI	Environmental Planning Instrument
EPL	Environment Protection License
ESD	Ecologically Sustainable Development
IESC	Commonwealth Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development
kL	Thousand litres
LDP	Licensed Discharge Point
LEP	Local Environmental Plan
LGA	Local Government Area
LW	Longwall
Material	The material set out at section 5 of this Statement of Reasons
Mining SEPP	*State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*
Mt	Million tonnes
Mtpa	Million tonnes per annum
NPfI	*Noise Policy for Industry (2017)*
PAR	Project Amendment Report
PNTL	Project Noise Trigger Levels
Project	Tahmoor South Coal Project, as described in section 2.3 of this Statement of Reasons
PRP	Pollution Reduction Program
REA	Reject Emplacement Area

RoM	Run-of-Mine
RFI	Request for Further Information
RL	Reduced Level
RRFI	Response to Request for Further Information
RtS	Response to Submissions
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
Site	As described in section 2.1 of this Statement of Reasons
SPAR	Second Project Amendment Report
SRD SEPP	SEPP (State and Regional Development) 2011
SSA	Subsidence Study Area (as addressed in the EIS)
SSD	State significant development
SSTF	Shale Sandstone Transition Forest
VLAMP	*Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments*
WTP	Water Treatment Plant

1 INTRODUCTION

1. On 18 December 2020, the NSW Department of Planning, Industry and Environment (the **Department**) referred a State significant development application (SSD-8445) (**Application**) from Tahmoor Coal Pty Ltd (**Applicant**) to the NSW Independent Planning Commission (**Commission**) for determination.

2. The Application seeks approval for new underground mining domains to the south of the existing Tahmoor Mine (the **Site**) to extract an additional 33-million tonnes of run-of-mine coal over a 10-year period at a maximum rate of four-million tonnes per annum (the **Project**). The Site lies within the Wollondilly and Wingecarribee Local Government Areas (**LGAs**), with mining proposed within the Wollondilly LGA only.

3. The existing Tahmoor Mine is located near Tahmoor, in the Southern Highlands region of NSW. The primary method of coal extraction until 1987 was bord and pillar mining, after which longwall mining was introduced. Longwall mining is currently used to extract coal from the Bulli Seam at a rate of up to three-million tonnes per year. The existing longwalls currently extend under parts of Couridjah, Thirlmere, Tahmoor and Picton. The coal produced from the Tahmoor Mine from 2017 to August 2020, on average was 97.5% metallurgical (coking) coal and 2.5% thermal coal. Approximately 25% of coking coal is sold to domestic markets with the remainder sold internationally. The Applicant has specified that mining within the Tahmoor North mining area is scheduled for completion by approximately 2022, depending upon geological and mining conditions.

4. The Application proposes longwall mining within the Bulli Seam within the boundaries of Consolidated Coal Leases (**CCL**) 716 and 747. The Mining would occur within 12 longwalls located to the south of the existing longwalls, and partially underlying the township of Bargo. Coal processing and handling would occur at the existing pit-top site. The Applicant has specified that approximately 90-95% of product coal would be coking coal and the remaining 5-10% would be thermal coal. The majority of this product coal would be transported off-site by rail using the existing rail loop and would be destined for Port Kembla and occasionally Newcastle for shipment to Australian and international markets.

5. An earlier iteration of the Project was previously referred to the Commission on 7 June 2019, however the Application was withdrawn from determination by the Commission and returned to the Department for further assessment. The Department wrote to the Commission on 5 July 2019 to advise that the Applicant intended to modify the proposed mine plan and reject emplacement area (**REA**) and as a result, the Commission released a statement on 9 July 2019 advising that the planned public hearing was cancelled. The second referral was made on 18 December 2020, as stated above.

6. The Project is classed as State significant development (**SSD**) under clause 8(1)(b) of the *State Environmental Planning Policy (State and Regional Development) 2011*, as it is development for the purpose of coal mining.

7. The Commission is the delegated consent authority for the Application as the Minister for Planning and Public Spaces, in October 2020, requested that the Commission hold a public hearing into the carrying out of the Project and determine the Application.

8. Mr John Hann was nominated by the Chair of the Commission pursuant to sections 2.11(2) and (2A) of the *Environmental Planning and Assessment Act 1979* (**EP&A Act**) to determine the members that would constitute the Commission Panel for this Application. Mr Hann nominated Professor Richard Mackay AM (Chair) and Professor Christopher Fell AO to constitute the Commission determining the Application.

2 THE APPLICATION

2.1 Site Location and Layout

9. The Site is described in section 1.2 of the Department's Assessment Report and is shown in Figure 1 below. The Site is located in both the Wollondilly and Wingecarribee LGAs, however no longwall panels or Project infrastructure are proposed in the Wingecarribee LGA.

10. Tahmoor Mine is made up of three distinct mining areas, Tahmoor Central, Tahmoor North and Tahmoor South. Tahmoor South comprises a single mining domain. Other potential mining areas (Eastern and Southern domains) were considered by the Applicant but mining is not proposed in these locations.

11. The proposed longwall layout is shown in Figure 2. The proposed mining domain is located south of the existing domains and comprises two series of six longwall panels.

2.2 Background to the Application

12. The Applicant amended the proposal significantly between the Environmental Impact Statement (**EIS**), Project Amendment Report (**PAR**) and Second Project Amendment Report (**SPAR**). Both the PAR and SPAR were formal amendments to the Application, pursuant to clause 55 of the *Environmental Planning and Assessment Regulation 2000* (**EP&A Regulation**). These changes are described in section 2.1 of the Department's Assessment Report. A summary of these changes is provided in Table 1, taken from the Department's Assessment Report.

***Figure 1**: Site Location and Layout (source: SPAR)*

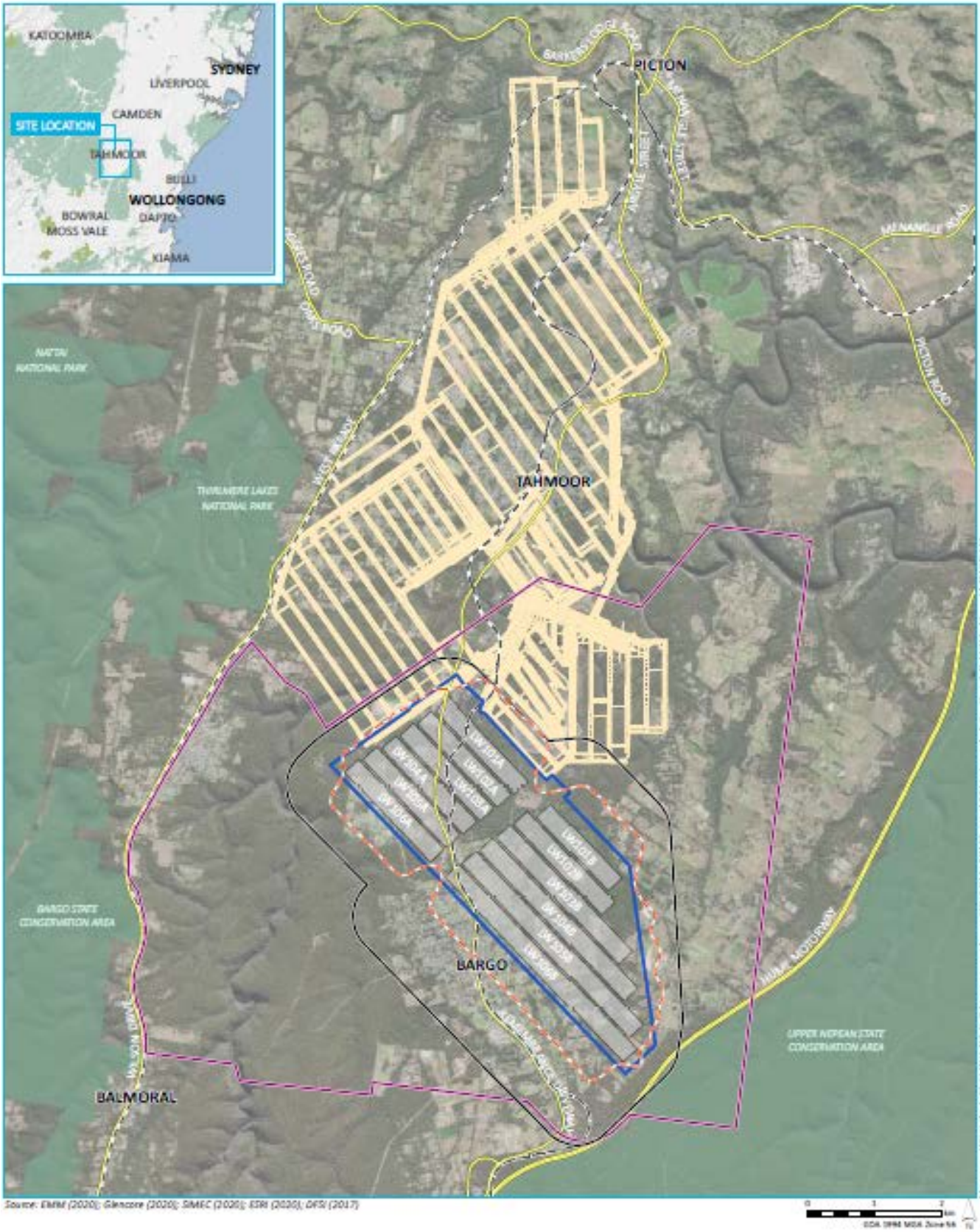


***Figure 2**: Longwall Layout (source: RRFI 1)*

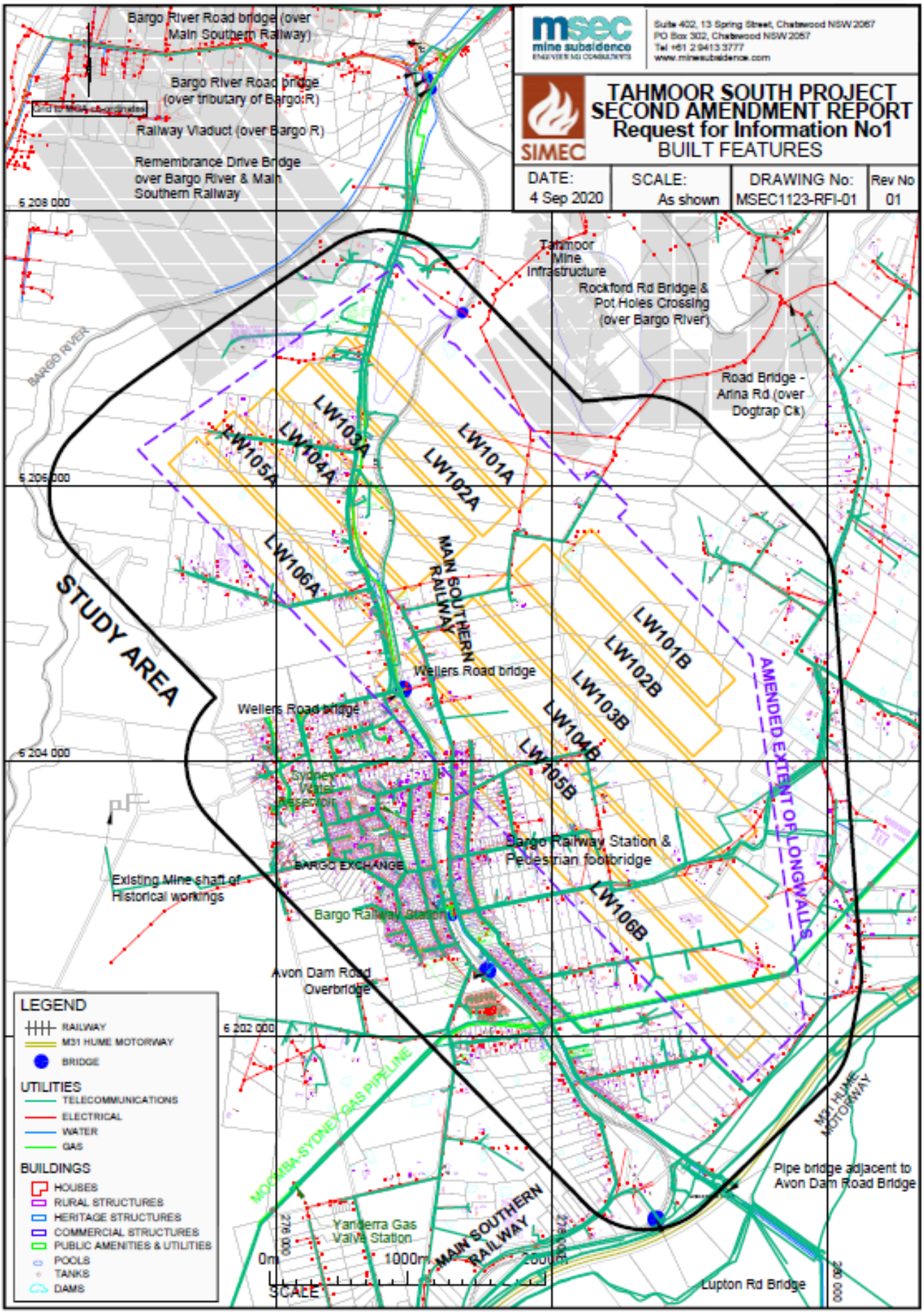


***Table 1**: Amendments to the Application (source: adapted from Department's Assessment Report)*

	EIS	**PAR**	**SPAR**
ROM Coal Extraction	48 Mt over 13 years	43 Mt over 13 years	33 Mt over 10 years
Mine Plan	Nine longwalls (LW101 – LW109) up to 305 m wide and 2.85 m high	Removal of one longwall (LW109) beneath Dog Trap Creek Reconfigure longwall layout to comprise two series of shorter longwalls (LW101A- 106A and LW101B-108B) Reduction in longwall width to 285 m and height to 2.6 m	Removal of two longwalls (LW107B and LW108B beneath Bargo
Reject Emplacement Area	Volume of rejects 14.3 Mt Increase in height from Reduced Level (**RL**) 300 m to RL 305 m Extension area (clearing) of 43 ha Operate 24 hours a day, 7 days a week	Volume of rejects 11.6 Mt Increase in height from RL 305 m to RL 310 m Reduction in extension area to 11.06 ha Restrict transport of rejects via conveyor to daytime and evening hours (7 am to 10 pm) only	Volume of rejects 9.7 Mt Increase in height from RL 310 m to RL 320 m No extension to approved footprint Continue restricted transport hours
Mine Ventilation	Use of existing mine upcast vent shaft (T2) in emergency situations only New upcast (TSC1) and downcast (TSC2) vent shafts Clearing of 9.52 ha	Continued use of existing mine upcast vent shaft (T2) with reduction in use from two fans to one fan No change to new upcast (TSC1) and downcast (TSC2) vent shafts Clearing of 9.52 ha	No change to use of existing vent shaft (T2) Reduction in clearing required for new upcast (TSC1) and downcast (TSC2) vent shafts Clearing of 8.84 ha
Transmission Lines	No changes or additional lines proposed	Inclusion of easement for 66- kV overhead transmission line from surface facilities site to new vent shafts Clearing of 2.99 ha	Reduction in clearing required for construction of transmission lines Clearing of 1.26 ha
Intersection with Mine Access Road	Proposed upgraded intersection	No change from EIS	No change from EIS
Carpark	Additional 150 parking spaces proposed	Carpark not proposed	Carpark not proposed

2.3 Summary of the Application

13. The Application is described at section 2.2 of the Department's Assessment Report. A summary of the Application is provided in Table 2, below, taken from the Department's Assessment Report.

***Table 2**: Summary of the Application (source: adapted from Department's Assessment Report)*

Aspect	Description
Project Life	Approximately 2032 (two years construction and 10 years coal extraction)
Coal Extraction	Estimated 33 Mt of recoverable ROM coal at a rate of up to 4 Mtpa
Coal Products	Coking coal (90-95%) and thermal coal (5-10%)
Mine Method	Underground longwall mining
Mine Schedule	LW101A-103A – 2022 to 2024 LW101B-106B – 2025 to 2030 LW104A-106A – 2031 to 2032
Coal Processing	Continued use of existing on-site Coal Handling and Processing Plant (**CHPP**), upgraded to include a new coarse rejects screen, additional belt filter capacity and increased thickener capacity
Ventilation	Continued use of existing upcast vent (T2) Construction and operation of an upcast vent (TSC1) and a downcast vent (TSC2) at two new sites along Charlies Point Road to the south of the REA (clearing of 8.84 ha)
Transmission Line	Construction of new 66 kV electrical power line to vent shaft sites (clearing of 1.26 ha)
REA	Continued use of existing REA, with increased height from RL 300 m to RL 320 m to accommodate up to 9.7 Mt of additional coal rejects (no extension to approved footprint)
Water Management	Surface water runoff: continue to be reused on-site (dust suppression, coal processing) with wet weather discharges from existing sediment basins regulated by the Environment Protection Authority (**EPA**). Two new sediment basins (S11 and S12) to be constructed to collect runoff from the REA. Mine water: commissioning of a new Water Treatment Plan (**WTP**) required under special conditions issued by the EPA. Treated water (up to 2,030 ML/year) to continue to be discharged via Licensed Discharge Point (**LDP**) 1 into Teatree Hollow under new water quality limits Excess mine water: transfer and return of excess mine water to and from the proposed underground storage areas within goaf areas of Tahmoor North using existing mine infrastructure (around 242 ML/year excess mine water with underground storage capacity of 4,725 ML). Note: Tahmoor Coal must modify the existing development consent for the Tahmoor North Mine (67/98) dated 1999, or any other relevant consent, to obtain approval.
Sewage Treatment	Upgrade of the existing sewage treatment plant (peak capacity of 61 kL/day) to produce effluent of a suitable quality to enable discharge via LDP 1 or to be used in future for irrigation of the REA
Gas Management	New gas drainage system from underground mine area to surface facilities site

	Continued use of existing on-site gas infrastructure including the Gas Plant, Gas Vent, Gas Flare Plant and Waste Coal Mine Gas Power Plant
Product Transportation	Continue to transport up to four laden trains [per day] from the mine to the Port Kembla Coal Terminal via the existing mine rail load out, rail loop, the Main Southern Railway and the Moss Vale to Unanderra Railway. Occasional transport of product to Newcastle (Port Waratah) Road transport (receipt of ROM coal and dispatch of product coal and reject) of up to 200,000 tpa and 3,000 t per day, with a maximum of 16 truck movements per hour
Mine Site Access	Continued use of existing vehicular access to the surface facilities site via Remembrance Drive. Upgrade of intersection to provide dedicated right-hand turning bay from the south and extended acceleration and deceleration lanes
Rehabilitation and Closure	Rehabilitate and make safe all surface facilities following completion of mining to a condition suitable for a range of future land uses
Workforce	Ongoing employment of 390 permanent and contract staff, with an additional 50 to 175 staff prior to completion of Tahmoor North and start of secondary extraction at Tahmoor South
Hours of Operation	Operational activities (underground mining, rail transport, surface facilities site, vent shaft sites): 24 hours a day, 7 days a week Road transport (coal product and reject): 7 am to 6 pm Monday to Saturday REA haulage: 7 am to 10 pm, 7 days a week (following commencement of second workings) Construction activities: 7 am to 6 pm Monday to Friday, and 8 am to 1 pm Saturday, with no construction activities on Sundays or public holidays Drilling activities at vent shaft sites: 24 hours a day, 7 days a week
Capital Investment Value (CIV)	$342-million

3 THE DEPARTMENT'S ASSESSMENT

3.1 Key Steps in the Department's Assessment

14. The Application, including the EIS, was submitted to the Department in January 2019 and the Department's Assessment continued up until the referral to the Commission on 18 December 2020.

15. The Department's engagement process, carried out on behalf of the Commission, is described in section 5.2 of its Assessment Report. The EIS was exhibited from 23 January 2019 to 5 March 2019 and 83 submissions were received from the community and interest groups, including 9 (11%) objecting and 72 (87%) in support of the Project.

16. The Department received a further 134 representations after the EIS exhibition period had formally closed. The majority (84%) of the additional representations were objections to the Project. These submissions were provided to the Commission as part of the referral. Key issues raised in all submissions to the Department from the community and special interest groups are summarised in section 5.4 of the Department's Assessment Report.

17. The Department received written advice from 14 government agencies. The key issues raised by agencies are listed in Table 7 of the Department's Assessment Report.

18. The Applicant's Response to Submissions (**RtS**) and PAR, both dated 21 February 2020, were provided to Agencies that had raised issues regarding the EIS.

19. The Applicant's SPAR, dated 3 August 2020, was sent to those government agencies that had identified residual issues following review of the RtS and PAR.

20. The Department also sent requests for further information (**RFI**) to the Applicant on three occasions. The Applicant provided Responses to Requests for Further Information (**RRFI**), including RRFI 1 on 14 September 2020, RRFI 2 on 23 October 2020 and RRFI 3 on 4 November 2020.

21. The Department also requested advice from the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (**IESC**) on 21 January 2019. The IESC advice is included at Appendix F of the Department's Assessment Report and summarised in Table 9 of the Department's Assessment Report.

3.2 The Department's Recommendation

22. Section 6.1 of the Department's Assessment Report lists the key issues identified by the Department in its whole of government assessment of the Application, as follows:

    - *potential subsidence impacts on houses and built features in Bargo and the surrounding rural residential areas;*
    - *groundwater drawdown and potential impacts to water supply levels, yield and quality of privately-owned bores;*
    - *subsidence induced impacts to watercourses including impacts to key stream features such as pools; and*
    - *potential noise impacts to residential receivers in the vicinity of the surface operations.*

23. The Department's detailed consideration of the above key issues is presented in sections 6.2 to 6.7 of its Assessment Report, with other issues addressed in section 6.8.

24. The Department recommends further amendments to the Project in section 2.2 of its Assessment Report. Based on advice from Heritage NSW and the Department's Biodiversity, Conservation and Science Directorate (**BCS**), the Department has recommended shortening longwall 103B by 400m to avoid undermining Dog Trap Creek. The Department has not recommended shortening LW101B and LW104B, noting the consequential economic impacts of sterilising substantial volumes of coal. These recommendations are given further consideration in section 8.2 of this Statement of Reasons.

25. The Department's evaluation of the Application is provided in section 7 of its Assessment Report. The Department finds that, on balance, the benefits of the Project outweigh its residual costs, that the Project is in the public interest, and that it is approvable subject to the recommended conditions.

26. The Department's Assessment Report forms part of the Commission's consideration of the Project pursuant to section 4.6 of the EP&A Act.

4 THE COMMISSION'S ASSESSMENT

4.1 The Commission's Meetings

27. As part of its assessment process, the Commission conducted a site and locality inspection, held meetings with the Department, the Applicant, Wollondilly Shire Council, Wingecarribee Shire Council, and the EPA (with the Department attending). The Commission also held a public hearing as requested by the Minister for Planning and Public Spaces. These events are detailed in Table 3 and are discussed further below.

28. The Commission also offered meetings to Heritage NSW and the BCS, both of which were declined.

29. Meeting and hearing transcripts and presentations were all made publicly available on the Commission's website.

***Table 3** – Commission's Meetings*

Meeting	Date of Meeting	Transcript/Notes Available on
Site and locality inspection	9 February 2021	16 February 2021
Department	10 February 2021	14 February 2021
Applicant	10 February 2021	12 February 2021
Wollondilly Council	10 February 2021	12 February 2021
Wingecarribee Council	10 February 2021	12 February 2021
Environment Protection Authority	10 February 2021	12 February 2021
Public Hearing	15 February 2021 – 17 February 2021	22 February 2021

30. The site and locality inspection was attended by the Commission, the Applicant, and a representative of one community group, the National Parks Association, Macarthur Branch. Invitations were also extended to a second community group, Undermined Inc, as well as the Tharawal Local Aboriginal Land Council and the Gundungurra Tribal Council Aboriginal Corporation #6; however, the additional invitees either did not reply or were not available on the day. The site inspection was completed via minibus and on foot. The Commissioners were provided with tablets to enable ready understanding on site of the precise location and extent of existing or proposed underground workings relative to their above-ground position. The Commission published notes and a photographic log of the site inspection, documenting locations visited by the Panel and summarising key observations and discussions.

31. The Commission conducted a three-day electronic public hearing on 15,16 and 17 February 2021, with registered speakers presenting to the Panel via videoconference or telephone. The Commission heard presentations from 88 speakers in addition to the Department and the Applicant. Proceedings were livestreamed in full on the Commission's website, with a live audio stream made available via a toll-free telephone service.

4.2 Public Engagement

32. The Commission invited written submissions from all persons from 18 December 2020 to 24 February 2021. The Commission received a total of 1853 written submissions, comprising of 1415 in support, 406 objecting, and 32 neither supporting nor objecting but offering comment.

33. Topics raised in support of the Project in public hearing presentations and written submissions to the Commission, included:

- Job retention and creation
- Benefits to the local, regional and national economies
- Lack of alternative local employment
- Offers continuity and financial security to mine workers and their families
- Contribution to the economy of Port Kembla
- The centrality of mining to the character of Tahmoor and surrounds
- Flow-on benefits to suppliers and contractors
- Flow-on benefits to local businesses
- Generation of tax revenue
- Meeting an ongoing demand for metallurgical coal
- Lack of a financially or technologically viable alternative to metallurgical coal in steelmaking
- The importance of steel to industry and society
- Benefits of using pre-existing mine infrastructure
- Improvements to the scheme relative to earlier iterations, including the removal of longwalls
- Applicant's commitment and demonstrated capacity to mitigate subsidence and other environmental impacts
- Applicant is a safe and reputable operator
- Mine offers a good working environment, with positive family values
- Applicant actively supports local causes

34. Key issues raised in objection to the Project in public hearing presentations and written submissions to the Commission, included:

- Subsidence impacts on homes
- Subsidence impacts on infrastructure
- Subsidence impacts on the environment, including watercourses, dams, rivers and groundwater
- Historically inadequate resolution of subsidence impacts to homes, and the associated stress and disruption to homeowners
- Impacts on property values from underground mining
- Lack of transparency around the subsidence resolution process
- Inadequacy of the funds set aside by the Applicant for subsidence restitution
- Pollution to surface waters including Teatree Hollow, Bargo River, Mermaid Pools and the Nepean River
- Surface-water and other environmental impacts of undermining Dog Trap Creek
- Impacts to bore water and the implications for bore-water users
- Potential causation or continuation of impacts on Thirlmere Lakes
- Questionable viability of the mine
- Overstated employee benefits
- Lack of community consultation and engagement by the Applicant
- Creation of divisions and disharmony within local communities
- Deterrence or prevention of alternative land uses
- Greenhouse gas (**GHG**) emissions and contribution to climate change
- Public health impacts of air pollution
- Noise impacts from the pit-top site and railway
- Impacts on local biodiversity

35. In addition to reading the text of written submissions, in order to supplement the Panel's understanding of the written submissions, a word frequency and cluster analysis was completed on unique author submissions (after multiple submissions from each single submitter had been amalgamated). The analysis was undertaken by consultants Online Gravity on behalf of the Commission and identified the key themes raised in unique author submissions made to the Commission. The analysis showed that the key issues raised were as follows:

    1. Employment impacts (69.6%)
    2. Property impacts (24.9%)
    3. Environmental impacts (5.5%)

36. Figure 3 below illustrates the composition of brief versus detailed submissions and the proportion of supporting and objecting submissions in each category. Figure 4 illustrates the composition of key issues raised in unique author submissions and the proportion of supporting and objecting submissions in each category.

Figure 3: *Length of Submissions*

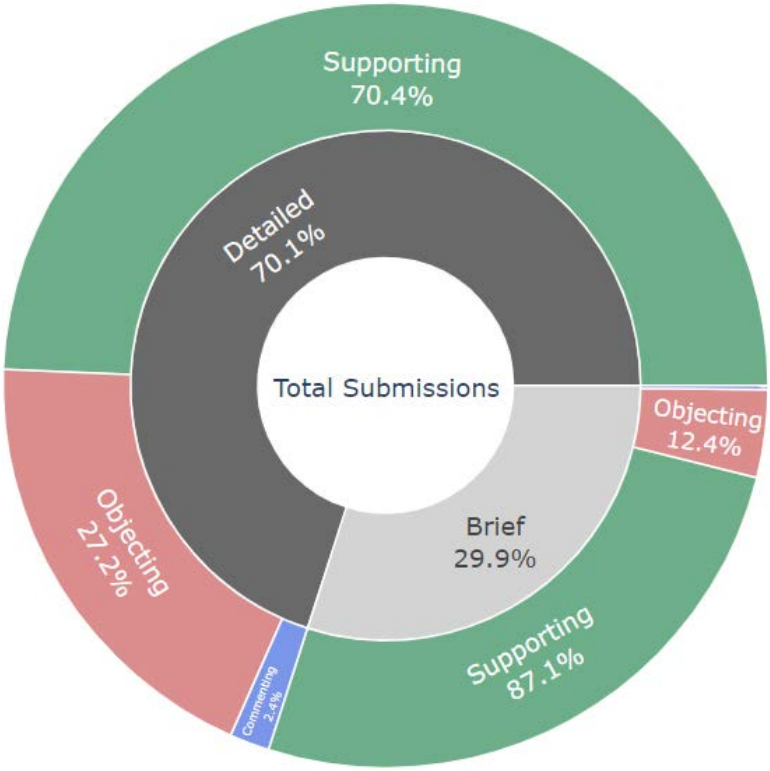
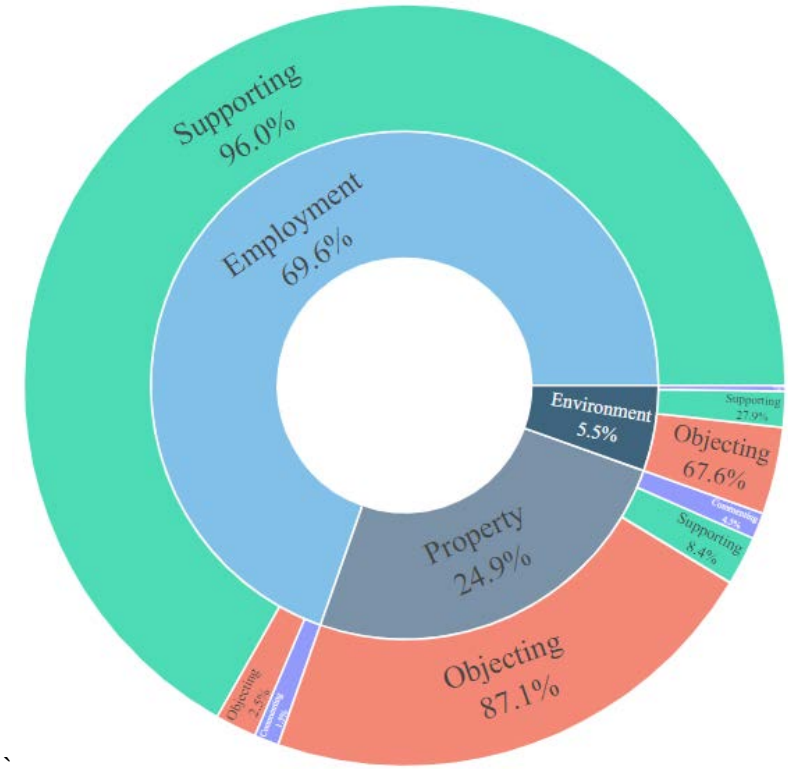
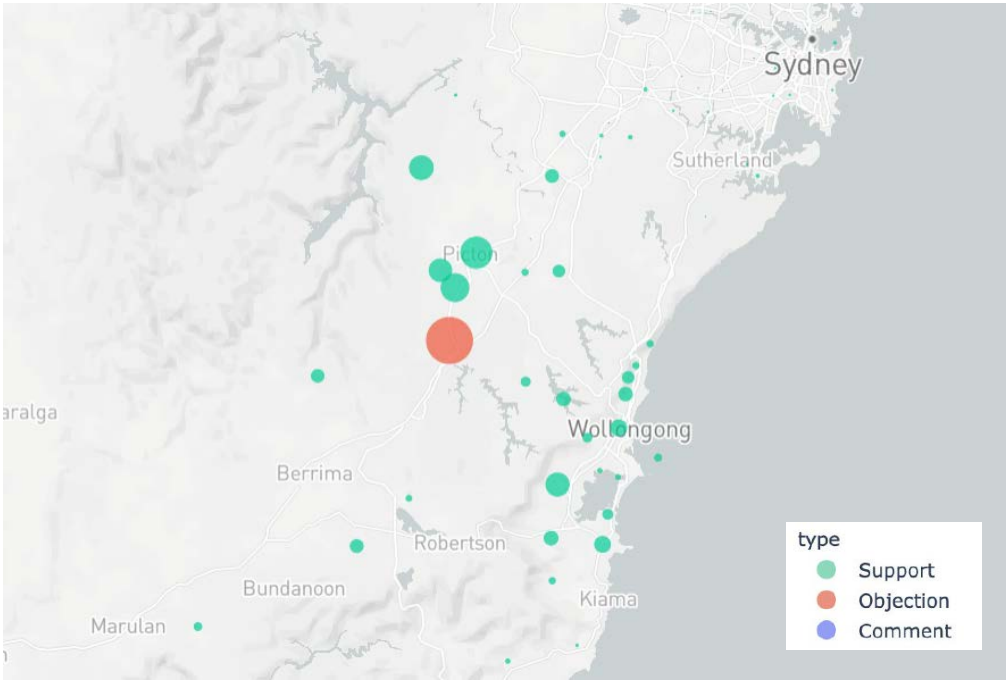


***Figure 4**: Key Issues*



37. Figure 5 illustrates clustering of unique author submissions including the nature of their submissions.

***Figure 5**: Location of Submitters (note: circle size indicates number of submissions in cluster)*



38. The Commission notes that objections were primarily clustered around the Bargo area, and submitted from addresses above proposed longwall panels, or within the subsidence study area.

39. The Commission reopened submissions following receipt of new material (section 5) - the Department's letter dated 12 April 2021 and the letter from the Applicant to the Department dated 9 April 2021 - both of which concerned the Project's GHG emissions (section 8.15). The Commission invited written submissions in relation to the two letters only, from 15 April 2021 to 20 April 2021.

40. Excluding submissions that clearly did not relate to the new material, the Commission received a total of 62 written submissions in the second submission period. These comprised of 11 in support, 50 objecting, and 1 neither supporting nor objecting but offering comment. These responses are discussed further in section 8.15 (greenhouse gases) of this Statement of Reasons.

5 MATERIAL CONSIDERED BY THE COMMISSION

41. In this determination, the Commission has carefully considered material (**Material**) including the documents listed below. The listed documents are all available on the Commission's or the Department's respective websites.

- the Secretary's Environmental Assessment Requirements (**SEARs**) dated 20 June 2018
- the government agency written comments to the Department regarding the SEARs
- the Tahmoor South Capital Investment Value Report and cover letter, both dated 23 November 2018, and submitted to the Department
- the Applicant's EIS, dated 21 December 2018
- all submissions made to the Department in respect of the Application during the public exhibition period of 23 January 2019 – 5 March 2019
- the additional 134 submissions subsequently received by the Department
- all Council and government agency written submissions and expert advice to the Department in respect of the Application
- the Department's Preliminary Issues Report, dated June 2019
- the Applicant's Response to Submissions report dated, 20 February 2020
- the Applicant's Project Amendment Report, dated 20 February 2020
- the Applicant's Response to Request for Information, dated 14 September 2020
- the Applicant's Response to Request for Information 2, dated 23 October 2020
- the Applicant's Response to Request for Information 3, dated 4 November 2020
- the Applicant's letter to the Commission dated 1 April 2020 regarding the No Mine at Bargo campaign
- the Commission's letter to the Applicant, dated 16 April 2020, responding to the Applicant's letter regarding the No Mine at Bargo campaign
- the Applicant's Second Project Amendment Report, dated 3 August 2020
- the Department's letter of referral, dated 17 December 2020
- the Department's Assessment Report, dated 17 December 2020
- the Department's recommended conditions provided with the referral to the Commission
- the notes and photographic log of the site inspection held on 9 February 2021
- the handouts provided by the Applicant at the site inspection held on 9 February 2021
- the transcripts and presentations for the stakeholder meetings listed in Table 1
- all speaker comments and presentations to the Commission at the public hearing held on 15,16 and 17 February 2021
- the Applicant's written submission to the Commission, dated 21 February 2021
- all written comments received by the Commission up until 24 February 2021
- all written comments received by the Commission from 15 April 2021 to 20 April 2021
- the Department's email to the Commission, dated 25 February 2021, providing examples of undermined State Heritage Register items
- the Commission's letter to the Applicant, dated 2 March 2021, noting corrections to the Chair's opening statement at the public hearing,
- the Department's email to the Commission, dated 30 March 2021, correcting examples of undermined State Heritage Register items
- the Commission's letter to the Department, dated 31 March 2021, regarding the Project's Scope 1 GHG Emissions
- the Applicant's letter to the Department, dated 9 April 2021, regarding the Project's Scope 1 GHG Emissions
- the Department's letter to the Commission, dated 12 April 2021, regarding the Project's Scope 1 GHG Emissions
- the Commission's email to the Department, dated 15 April 2021, regarding revisions to Department's recommended conditions of consent

- the Department's email to the Commission, dated 22 April 2021, responding regarding revisions to Department's recommended conditions of consent
- Thirlmere Lakes - What We Know brochure (OEH 2013)
- Thirlmere Lakes Inquiry, Final Report of the Independent Committee (23 October 2012)
- Thirlmere Lakes Inquiry – Review of the Final Report of the Independent Committee (NSW Chief Scientist and Engineer, February 2013)

6 STRATEGIC CONTEXT

6.1 Key Policies and Guidelines

42. Key policies and guidelines relevant to the Application include:

- *NSW Noise Policy for Industry*
- *Interim Construction Noise Guideline*
- *NSW Road Noise Policy*
- *NSW Aquifer Interference Policy*
- *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2016)
- *NSW Climate Change Policy Framework (OEH, 2016)*
- *NSW Risk Assessment Guideline for Groundwater Dependent Ecosystems*
- *Guidelines for the economic assessment of mining and coal seam gas proposals* (Department of Planning and Environment, December 2015)
- *NSW Net Zero Plan Stage 1: 2020-2030 (*Environment, Energy and Science branch of the Department, March 2020)
- Strategic Statement on Coal Exploration and Mining in NSW (NSW Government, 2020)
- Guidelines – Processing Mine Subsidence Compensation, (Subsidence Advisory NSW)
- Community Consultative Committee Guideline (NSW Government, 2019)

6.2 Context

43. The need for the Project is discussed in section 6.1 of the Applicant's EIS, as follows:

> *The high-quality coking coal mined at Tahmoor Mine is a valuable source of raw material for steel manufacturing. The proposed development would allow for the continued supply of this valuable product to existing domestic and international markets.*
>
> *Similarly, the proposed extent of underground mining and the rate at which extraction would take place (up to four (4) million tonnes of ROM coal per annum) reflects the consideration of known geological, environmental and rail transport limitations. This scale of development also balances the economic viability and capital expenditure required for the development, with the ability to supply product coal into established export markets.*
>
> *Moreover, in responding to the demands of the export markets, it is considered preferable from an environmental, economic and social perspective to continue an existing mining operation and utilise existing facilities rather than to establish a separate, new mine to access this resource (refer to Section 6.2.2 for details).*
>
> *Without approval, completion of mining in the Tahmoor North mining area would result in closure of Tahmoor Mine by approximately 2022 prohibiting the extraction of a coking resource via existing infrastructure. Conversely, if approved, the proposed development would prolong the life of Tahmoor Mine and enable recovery of a greater proportion of the existing resource, which in turn would enable ongoing supply to existing customers and direct ongoing employment for 390 employees for a further 13 years and between 50 and 175 additional employees during the transition period.*

44. The strategic context of the Application is discussed in depth in section 3 of the Department's Assessment Report, which addresses the following matters:

- background on coal mining in the Southern Coalfield

- the operations of the GFG Alliance, the ultimate owner of the mine
- the proportion of coal from the Tahmoor Mine that is sold domestically (approximately 25%)
- the significance of the mine as an employer in the local area
- the significance of coal mining to the NSW economy, as set out in the Strategic Statement on Coal Exploration and Mining in NSW
- the transition to coal-free steel making
- the ongoing demand for coking coal
- the benefits of extending existing mines
- Wollondilly Council's Local Strategic Planning Statement and the future of housing in the area
- the Bargo Mine Subsidence District and its declaration in 1975
- the Thirlmere Lakes Inquiry
- the Project's location near to the Metropolitan Special Area
- comments made in the Independent Expert Panel for Mining in the Catchment's initial and final reports (Parts 1 and 2)

45. Section 3 of the Department's Assessment report includes the following finding regarding the Project in relation to the NSW Government's *Strategic Statement on Coal Exploration and Mining in NSW*:

> *Overall, the Department considers that the Project, being an extension to an existing underground coal mine primarily targeting coking coal resources for steel making, aligns with the objectives of the strategic statement.*

46. Many of the matters addressed in the strategic context section of the Department's Assessment Report are discussed further in section 8 of this Statement of Reasons, which relate to each of the key issues identified by the Commission.

47. It is noted for clarification that the Department's Assessment Report describes the Applicant as the owner and operator of the mine; however, the mine is directly owned by Bargo Collieries Pty Ltd, a subsidiary of Tahmoor Coal Pty Ltd. The history of ownership of the mine, including parent companies is available in Table 1.4 of the Applicant's EIS. The mine is currently owned by Bargo Collieries Pty Ltd, a subsidiary of Tahmoor Coal Pty Ltd, itself a subsidiary of SIMEC Mining. In clarifying this matter, the Commission notes that the identity of this or any Applicant (including the compliance history of that Applicant) is not a relevant consideration for a consent authority like the Commission in determining a development application such as the present Application.

48. The Commission notes that the Applicant's Consolidated Coal Lease CCL 716 expired on 13 March 2021 and CCL 747 is due to expire on 6 November 2025. The Commission understands that under the *Mining Act 1992*, these leases will continue to have effect until any renewal applications are finally disposed of.

7 STATUTORY CONTEXT

7.1 Permissibility

49. All proposed development associated with the Project is located within the Wollondilly LGA. The range of land zones which apply to the Project are identified in section 4.2 of the Department's Assessment Report. The *Wollondilly Local Environmental Plan 2011* (**LEP**) permits the Project in some of these zones and prohibits it in others.

50. Irrespective of the partial prohibition of the Project under the LEP, clause 7(1) of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (**Mining SEPP**) provides that *'underground mining carried out on any land'* is permissible with development consent. Further, clause 8 of the Mining SEPP prevails over any provisions of an LEP that are a pre-requisite for or would otherwise prohibit development for the purpose of mining. The Project is therefore permissible with development consent.

7.2 Surrender of Existing Development Consents

51. Tahmoor Mine is subject to six existing development consents. Table 4 below is taken from the Department's Assessment Report and summarises the existing consents and the proposed approach to surrendering these consents.

***Table 4**: Existing development consents and their surrender (source: Department's Assessment Report)*

Consent	Consent Authority	Scope	Proposed approach
Bargo 1975/1976 (162/76)	Wollondilly and Mittagong Shire councils	Underground mining in CCL 747 and associated surface facilities west of Bargo	Surrender consent
Tahmoor DA 1975 (7105/47)	Wollondilly Shire Council	Underground mining in CCL 716, ML1308 and ML1642, associated surface facilities and transport of ROM coal	Surrender consent; surface facilities area to be covered by new consent (if approved)
Tahmoor DA 1979	NSW Planning and Environment Commission	Operation of CHPP and REA, modifications for gas extraction, extension of washery, transport of coal to Port Kembla by rail and by road within Wollondilly LGA (if rail unavailable)	Surrender consent following completion of current mining activities in Tahmoor North; surface facilities area and REA to be covered by new consent (if approved)
Tahmoor Gas Extraction DA 1985 (190/85)	Wollondilly Shire Council	Surface civil and mechanical work for gas extraction	Surrender consent; surface facilities area to be covered by new consent (if approved)
Tahmoor DA 1994 (DA 57/93 MOD 1)	Land and Environment Court	Underground mining in Mining Lease Application 1 (later ML1376). Emplacement of	Surrender consent following completion of current mining activities and mine

		rejects on site. Surface facilities and access shaft.	closure/rehabilitation in Tahmoor North
Tahmoor DA 1999 (67/98 MOD 4)	Minister for Planning [and Public Spaces]	Underground mining in ML1539, infrastructure, coal processing and transport	Surrender consent following completion of current mining activities and mine closure/ rehabilitation in Tahmoor North; surface infrastructure, coal processing and transport to be covered by new consent (if approved)

52. The statutory considerations regarding surrender of existing consents are set out in section 4.3 of the Department's Assessment Report.

53. For a development consent surrendered as a condition of a new consent, section 4.63 of the EP&A Act provides that the consent authority:

- is not required to re-assess the likely impact of the continued development to the extent that it could have been carried out but for the surrender of the consent;
- is not required to re-determine whether to authorise that continued development under the new development consent (or the manner in which it is to be carried out); and
- may modify the manner in which that continued development is to be carried out for the purpose of the consolidation of the development consents applying to the land concerned.

54. The Commission notes that the surrender of consents, as set out in Table 4, is reflected in the Department's recommended conditions of consent.

7.3 Integrated and other NSW Approvals

55. Section 4.4 of the Department's Assessment Report identifies approvals that are integrated into the SSD process as well as those that must be substantially consistent with any consent granted. The Department consulted with relevant government authorities that are responsible for providing integrated and other approvals and considered the relevant issues relating to these approvals in its assessment of the development. The Commission notes that the Applicant may also require approvals which are not integrated into the SSD process.

7.4 Commonwealth Approvals

56. Section 4.7 of the Department's Assessment Report notes that the Project was determined to be a controlled action and addresses the bilateral approvals pathway, stating:

> *On 12 January 2018, a delegate of the Commonwealth Minister for the Environment determined that the original project was a 'controlled action' under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) due to its potential impacts on Matters of National Significance (MNES), specifically listed threatened species and communities (sections 18 & 18A of the EPBC Act).*
>
> *Under the Bilateral Agreement between the Commonwealth and NSW governments, the Commonwealth has accredited the NSW assessment process under the EP&A Act, to enable an integrated assessment of the Project. However, the Commonwealth's decision-maker maintains a separate approval role, which would be exercised following the Commission's determination of the development application (if approved).*

On 12 October 2020, Tahmoor Coal submitted a variation request to the Commonwealth Minister for the Environment based on the SPAR. A decision on the variation request was made on 17 November 2020 which confirmed no change to the original controlling provisions.

Due to the timing of the variation referral process, the Department will provide a separate assessment for the Commonwealth Minister of the Project's potential impacts on Commonwealth matters not considered in this report (ie listed threatened species and communities) in accordance with any relevant agreement, policies or guidelines.

7.5 Mandatory Considerations

57. In determining this application, the Commission has considered such of the following matters as are of relevance to the development the subject of the Application (**Mandatory Considerations**):
    - the provisions of:
        - any environmental planning instrument;
        - any proposed instrument that is or has been the subject of public consultation under the EP&A Act and that has been notified to the Commission (unless the Planning Secretary has notified the Commission that the making of the proposed instrument has been deferred indefinitely or has not been approved);
        - any development control plan;
        - any planning agreement that has been entered into under s 7.4 of the EP&A Act, and any draft planning agreement that a developer has offered to enter into under s 7.4;
        - the Regulations to the extent that they prescribe matters for the purposes of s 4.15(1) of the EP&A Act;

      that apply to the land to which the Application relates;
    - the likely impacts of the development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality;
    - the suitability of the site for the development;
    - submissions made in accordance with the EP&A Act and Regulations; and
    - the public interest.

58. The Mandatory Considerations are not an exhaustive statement of the matters the Commission is permitted to consider in determining the Project. To the extent that any of the Material does not fall within the Mandatory Considerations, the Commission has considered that Material where it is permitted to do so, having regard to the subject matter, scope and purpose of the EP&A Act.

59. The following Environmental Planning Instruments (**EPIs**) apply to the Project and have been considered by the Commission:
    - *State Environmental Planning Policy Mining, Petroleum Production and Extractive Industries) 2007*
    - *SEPP (Infrastructure) 2007*
    - *SEPP (State and Regional Development) 2011 (***SRD SEPP***)*
    - *SEPP (Sydney Drinking Water Catchment) 2011*
    - *SEPP No. 33 – Hazardous and Offensive Development*
    - *SEPP No. 44 (Koala Habitat Protection) 2019*
    - *SEPP No. 55 – Remediation of Land*
    - *Wingecarribee LEP 2010*
    - *Wollondilly LEP 2011*

60. Pursuant to clause 11 of the SRD SEPP, development control plans do not apply to State significant development applications.

61. There are no existing planning agreements relevant to the Application; however, the Applicant is proposing to enter into a voluntary planning agreement with Wollondilly Shire Council. Table 6.8 of the Department Assessment Report states that the Applicant would commit to:

> *…contribute 1% of the project's capital investment value (approximately $3.4 million) towards upgrades at the Bargo Sportsground. Council advised that this agreement is supported in principle, with final terms to be agreed and established in an executed agreement following further consultation.*

62. The likely impacts of the Project, the suitability of the Site, and the public interest have been considered through consideration of the key issues addressed in section 8 of this Statement of Reasons and in the evaluation of the Project in section 9.

8 KEY ISSUES

63. The Commission has identified key issues following review of the Application, written submissions, presentations at the public hearing, the Department's Assessment Report and all other Material identified at section 5 of this Statement of Reasons. The Commission's consideration of these key issues is set out below.

8.1 Subsidence

Public Submissions

64. Many submissions were received regarding the potential subsidence impacts of the Project. Bottom-up analysis indicates that 25% of unique author submissions related to property impacts, and of these 87% were objecting. The Commission also notes that objections to the Application tended to be clustered around the Bargo area, near to the proposed longwall locations - and, in particular, within the Subsidence Study Area (SSA) addressed in the EIS. Issues raised in written submissions to the Commission and at the public hearing included:

- subsidence impacts on homes,
- subsidence impacts on dams, rivers, bores and the environment;
- potential impacts to infrastructure, including gas, rail, water and sewerage infrastructure;
- impacts to the Bargo Waste Management Centre;
- damage to heritage items;
- general objections to mining under houses or creek beds;
- predicted subsidence exceeding the building code criteria;
- inadequacy of the subsidence remediation and compensation process;
- issues with the processes of the previous Mining Subsidence Board, including requirements for non-disclosure agreements contributing to an opaque system;
- stress and disruption from length and uncertainty of both subsidence activity and the ensuing resolution process;
- subsidence threat as a deterrent to or prohibitor of development;
- effect of subsidence threat on property values and saleability;
- insufficiency of funds set aside for subsidence compensation;
- uncertainty regarding liability for subsidence compensation in the event of mine closure;
- a need for pre-mining surveys of all properties at risk of subsidence impacts, and;
- the potential for addition of further mining domains in the future.

65. Supporters of the Project noted that the Applicant had demonstrated capacity in the resolution of subsidence impacts to infrastructure, houses and the environment, and is committed to resolving any subsidence impacts arising from the Project. They also noted that the Applicant removed LW107B and LW108B through the SPAR, resulting in a reduction to the number of houses and other features at risk of subsidence impacts.

Wollondilly Shire Council's Position

66. During its meeting with the Commission, Wollondilly Shire Council raised concerns regarding subsidence impacts to the Bargo Waste Management Centre (**BWMC**) including the potential for pollution incidents and the possibility that the Council could be liable for remediation as the Environment Protection Licence holder, stating:

> *…..a lot of the issues can be engineered and managed, but there is still a risk that if a pollution incident was to occur due to subsidence, council is still liable as the licence holder for that mitigation or correctional activity from the EPA, so they're subject to compliance action.*

So I guess that's one thing that's still – you know, I think we should acknowledge that particular issue, but overall we have been working with SIMEC – SIMEC, I'm not sure how you say it – but they have approached us and we've worked together to form a position, and through the conditions of consent we believe that we can work on that particular issue. But that – that last bit of risk is still one of those outstanding components, I guess, so that should be acknowledged. So that would be my – my overall broad statement.

67. Councillor Michael Banasik also attended Wollondilly Shire Council's meeting with the Commission and outlined feedback from residents regarding subsidence, including concerns with the resolution process of both the previous Mine Subsidence Board and its replacement, Subsidence Advisory NSW.

Subsidence Advisory NSW

68. Subsidence Advisory NSW made a written submission to the Commission following the public hearing. Subsidence Advisory NSW commented on recommended additional protections for homeowners, mine subsidence compensation system reforms, subsidence periods, management of properties during subsidence, the claim process, independent assessment of claims, compensation determinations, independent reviews and statutory appeals, customer feedback, and development within a mine subsidence district.

69. Subsidence Advisory NSW's submission to the Commission outlined recent reforms to the mine subsidence compensation system, as follows:

A wholesale review of the Mine Subsidence Compensation Act 1961 (repealed) and its administration by the former Mine Subsidence Board (MSB) was completed in 2017.

This review was initiated in response to an inquiry by the Independent Commission against Corruption into a former MSB employee and community complaints. The review identified considerable issues with the previous compensation framework, including a backlog of approximately 300 claims – some of which had been left unresolved for 10 years.

In response to the review findings, significant reforms were introduced under the Act in 2018 to improve the claims experience for property owners and make mine operators accountable for subsidence damage arising from their operations. Key improvements include:

- *Claim costs resulting from active mining are to be paid by the relevant mine operator, providing incentive for mine operators to reduce subsidence impacts*
- *Introduction of new independent claim assessments by technical experts in active mining areas*
- *Legislated 90 day timeframes for the assessment of claims (this timeframe commences on completion of subsidence in active mining areas)*
- *New option for independent review by Secretary of the Department of Customer Service or their delegate for property owners who disagree with the outcomes of their claim to request.*

Notwithstanding recent reforms, Subsidence Advisory NSW recognises legacy brand issues still exist within the Southern Coalfields community and is working to rebuild community trust. Should the project be approved, Subsidence Advisory NSW will further engage with the local community to ensure property owners are aware of their rights under the Act and claim process.

70. Subsidence Advisory also indicated that, in addition to recommendations made to the Department regarding modifications to reduce subsidence impacts, proposals had also been made to the Department to provide further options for some affected property owners as follows:

> *The Act does not include provisions for social impacts resulting from mine subsidence damage to property; however, Subsidence Advisory NSW has also recommended the Development Consent include conditions for Tahmoor Coal to offer property acquisition where damage reaches certain thresholds or where substantial damage has occurred and there is subsidence expected for more than one year. This would provide further flexibility to property owners should they wish to relocate.*
>
> *Subsidence Advisory NSW reiterates its recommendation for the Development Consent for the project to include a requirement for Tahmoor Coal to offer property acquisition when the house:*
>
> 1. *Reaches damage category R4 or R5; and/or*
> 2. *Is in tilt of greater than 10mm/m; and/or*
> 3. *Reaches damage category R3 or more and has/will be impacted by more than two longwalls.*

Applicant's Position

71. Subsidence is addressed in section 11.1.8 of the Applicant's EIS which summarised the findings as follows:

> *The overall findings of the assessments are that the levels of impact and damage to identified natural features and built infrastructure are manageable and can be controlled by the preparation and implementation of an Extraction Plan.*
>
> *Tahmoor Mine has subsided in the order of 1,541 residential homes and commercial premises, the majority of which experienced little if any damage from mine subsidence impacts. A small percentage experienced more significant impacts which have been rectified or continue to be repaired, replaced or otherwise satisfactorily addressed by Tahmoor Mine in close working relationship with SA NSW…..*

72. Amendments to proposed panel height and width and the resulting changes to subsidence impacts are discussed in section 7.1.4 of the PAR, which states:

> *It is noted that the predicted maximum total conventional subsidence, tilt and curvatures due to the extraction of the Amended Layout are less than the predicted maxima from the EIS Layout by approximately 15%, due to both the proposed reduction in panel width and proposed reduction in extraction heights.*

73. The removal of longwalls 107B and 108B is discussed in section 6.2.4 of the SPAR, which states:

> *Tahmoor Coal made the decision to make additional changes to the Project to further reduce potential environmental impacts, particularly potential subsidence impacts. The changes include the removal of two longwalls, LW107B and LW108B,* stating*:*
>
> *The changes will substantially reduce the number of houses and associated civil infrastructure that were predicted to be adversely affected by mine subsidence due to the extraction of the Project. A total of 143 houses are located directly above the proposed longwalls compared to 571 houses that were located directly above the longwalls considered in the PAR.*

74. The Applicant's RRFI included a response to concerns from Wollondilly Shire Council regarding the Bargo Waste Management Centre:

> *Tahmoor Coal is continuing to work with WSC regarding the BWMC. This includes forming a technical committee to identify potential impacts, assess the potential impacts, consider options and select measures to control potential impacts to the site. Further details on this technical committee are provided below in this letter.*
>
> *While this is a matter for the consent authority, Tahmoor Coal does not agree with WSC's preposition that the granting of consent for the Project may not be permissible, or that the extent of mining may need to be adapted to avoid and minimise impacts. As demonstrated above, it is Tahmoor Coal's view that subsidence and related impacts at the BWMC can be appropriately managed without requiring the proposed extent of mining to be adapted or revised to avoid or minimise impacts.*

75. The Applicant's RRFI2 provided the following breakdown of houses for which acquisition offers are possible:

> *The total number of houses where there could be a potential offer of acquisition, if R3 and R4 are considered together, is 28. In addition, the number of houses in the R5 category is 7. This totals 35 potential offers of acquisitions.*
>
> *As explained above, there is limited data available to confidently provide probabilities of R3 separately from R4 impacts. An estimate of the total number of houses in the R3 category is 15. Therefore, the potential offer of acquisitions when a house reaches damage category R4 or R5 is 20 (based on R4 of 13 plus R5 of seven). An estimate of the number of potential acquisition offers when a house reaches damage category R3, and has been impacted by more than two longwalls, is two.*

76. The Applicant's written submission to the Commission following the public hearing, dated 24 February, included a response to concerns regarding the estimated cost to repair subsidence related effects of the Project, stating:

> *Concerns were raised in several presentations at the public hearing that the cost to repair subsidence related impacts from the Project has been underestimated by Tahmoor Coal. The cost of repairs assumed in the economic assessment of the Project is $13.8 million in NPV terms.*
>
> *This cost was developed based on a number of factors, including the number of properties that could be potentially impacted, and published data by SA NSW on the average cost to repair houses affected by subsidence. It is therefore considered to be an appropriate estimate for the purpose of the economic assessment. However, regardless of the estimate used in the economic assessment, Tahmoor Coal will be liable for the costs associated with repairing all project subsidence related damages to a pre-mining state and is committed to meeting this obligation in accordance with the company's commitment to the local community, and in accordance with the statutory procedures in place and governed by SA NSW.*
>
> *In addition to the statutory framework provided by the Coal Mine Subsidence Compensation Act 2017 and managed by SA NSW, the rehabilitation security deposit held by the Resources Regulator for Tahmoor Coal also provides a further 'safety net' to ensure that funds will always be available to pay for required rehabilitation works. All exploration and mining title holders are required to lodge a security deposit with the Resources Regulator that covers the full rehabilitation costs of a mining or exploration operation. This requirement ensures that the NSW Government does not incur financial liabilities in the unlikely event of a title holder defaulting on their rehabilitation obligations.*

77. The Applicant's written submission to the Commission following the public hearing also commented on the Applicant's liability for subsidence compensation, stating:

If the mine ceases to operate, claims for compensation would continue to be managed in accordance with the legislated process under the CMSC Act.

Department's Position

78. Subsidence impacts are addressed in section 6.2 of the Department's Assessment Report, which includes the following findings:

> *The Department considers that the SubIA (MESC, 2020b) contains an adequate prediction of subsidence effects and assessment of likely impacts and consequences anticipated to be associated with the Project.*
>
> *The Department considers that the Project has been substantially modified to avoid subsidence-related risks and impacts when compared to the previously proposed longwall mining layouts. However, the Department acknowledges that the current Project is likely to result in subsidence impacts to a significant number of houses and other built features.*
>
> *The Department accepts that impacts to private residences and other structures would be managed and compensated for by SA NSW under the provisions of the CMSC Act, via the Coal Mine Subsidence Compensation Fund. The Department notes that this compensation framework ensures security to homeowners, irrespective of the mine company financial status.*
>
> *In-line with the existing Tahmoor North development consent, the Department has also recommended that additional safeguards be offered to homeowners whose houses experience significant and/or prolonged damage as a result of mine subsidence movements, including offering property acquisition as an option for compensation, rather than repair or rebuild. The Department believes these mechanisms would provide the homeowners confidence in the management and compensation process, coupled with additional options for acquisition if desired.*
>
> *The Department has proposed performance measures addressing safety, serviceability, repairability and compensation for all other built features. The performance measures vary according to whether the built feature is an item of key infrastructure, or an item of minor infrastructure or other built feature.*
>
> *The Department is satisfied that strict performance measures, together with an appropriate Built Features Management Plan (as a component of a robust Extraction Plan) would appropriately manage subsidence impacts on items of key infrastructure, minor infrastructure and other built features.*
>
> *…..*
>
> *However, SA NSW has identified that the proposed mine scheduling would mean that some houses would be impacted by more than one longwall and could therefore experience subsidence impacts for extended periods of time. In particular, houses located above LWs 103A and 104A could experience subsidence impacts for up to 7 years (i.e. from 2023 when mining commences in LW 103A until 2030 when mining commences in LW 104A). Therefore, several homeowners could be living in damaged properties for a number of years, or may require relocation on several occasions (where their properties require extensive repairs or rebuilding).*

79. During the public hearing, the Department responded to questions regarding the impact of subsidence on properties as follows:

. . . in addition to the statutory regime that is in place ….. we have also used the planning recommended conditions to overlay an additional element of certainty or additional element of compensation, such that those houses that are identified within a certain category – being R5, R4 or R5 or indeed R3 if it's impacted by more than one longwall, which goes to that point about the duration of the impact – that we would seek to provide those landowners with acquisition rights, which I think is only fair and reasonable . . .

80. During its meeting with the Commission, the Department responded to questions regarding the proposed shortening of Longwall 103B and the consideration of potential shortening of Longwall 104B, as follows:

So for 104B, you know, to avoid undermining, you know, the creek you would need a reduction of 700 metres. It would sterilise, I guess, double what 103B would do, so it's about 0.6 million tonnes of coal. I value that at about 106 million. I guess, the benefits would avoid undermining eight stream pools in this instance and reduce the likelihood of impact to the pools. I guess, one thing that came out of it, I guess, in sort of our discussions with the company too is that 103B is where the – there's sort of more of a valley feature that it commences. So it goes more into an incised topography. Whereas in 104B it does tend to – even the creek – there's a creek line there – it tends to flatten out.

So 103B is really where valley closure, you know, predictions increase, because – just because of the terrain. 104B – you know, the likelihood – like while it undermines it, given it's a flatter terrain, the likelihood of, you know, those valley closure impacts, you know, through – and upsidence are less likely. And if you look at – if you look at figure 20 in our report too, it gives a figure there of – you know, showing what the valley closure is at points – the pond points along the creek line, you know, for – for this 103B and without 103B. So there are benefits – even taking 103B out, you know, there are – there are clear benefits in, you know, reducing impacts on 104B as well. So while it undermines it, there is a reduced likelihood of impact as well through that section of the creek. You know, partly because it's sort of a flatter terrain through there.

Commission's Findings

81. The impacts of subsidence upon surface water, groundwater, biodiversity, Aboriginal heritage and historic cultural heritage are discussed in the other relevant Key Issues section of this Statement of Reasons.

82. Concerns were raised in public submissions regarding the possibility of mining occurring in further mining domains and the associated subsidence impacts that this could generate. The Department's recommended condition A5 limits the extent of underground mining to the areas shown on the submitted mine plan, which includes one domain only.

83. The Commission notes that the Applicant significantly reduced the predicted subsidence impacts by removing longwalls 107B and 108B in the SPAR. Although the reduction of predicted impacts is significant, the Commission notes that prior iterations of the proposed scheme are not necessarily the appropriate baseline for assessment of the subsidence impacts of the present Application.

84. Submissions also included concerns regarding the lack of transparency and the length of the subsidence resolution process based on experience from Tahmoor North and other subsidence areas. The Commission notes that changes to the subsidence resolution framework were introduced in 2018 pursuant to the *Coal Mine Subsidence Compensation Act 2017* (**CMSC Act**), as outlined in the Subsidence Advisory NSW submission to the Commission. As a result of these updates, the concerns regarding prior experiences are considered to be addressed by the new processes.

85. Concerns were raised in submissions regarding the potential for houses to be impacted by subsidence from multiple longwalls, resulting in protracted subsidence threats and impacts which are not compensated until subsidence is found to have ceased. Based on advice from Subsidence Advisory NSW, the Department's recommended condition C15 (subsidence acquisition rights) offers acquisition rights to the properties most impacted by subsidence, including by multiple longwalls. Recommended condition C15 provides:

> *The Applicant must offer acquisition rights to any landowner on privately owned land where a residence is subject to*
>
> *(a) subsidence damage category R4 or R5; and/or*
>
> *(b) tilt of greater than 10 mm/m; and/or*
>
> *(c) subsidence damage category R3 or more and has/will be impacted by more than two longwalls,*
>
> *as a result of the development.*

86. The Commission considers that there are some types of damage within category R3, including significant cracking of walls and damage to damp proof coursing, which warrant a similar approach as is proposed for damage in the R4 or R5 category. The Commission also observed that at different times it has been acknowledged as reasonable to afford extra options to properties affected by either one or more, or two or more, longwalls. In order to better address impacts from protracted subsidence, the Commission has imposed an amended version of condition C5 as recommended by the Department, to include voluntary acquisition rights for properties affected by certain types of damage within subsidence category R3 and that are impacted by more than one longwall. This change would offer affected property owners an alternative to a potentially lengthy resolution process and is consistent with the approach proposed by Subsidence Advisory NSW, but particular to the circumstances of the Project, and which will reduce the severity and longevity of potential subsidence impacts.

87. The sufficiency of funds identified for subsidence compensation was questioned in submissions. The Applicant's economic analysis submitted with the SPAR identified that subsidence mitigation would incur a cost of $13.8 million in NPV terms. The Applicant's written submission to the Commission confirmed that this amount was accurate for the purposes of the economic assessment of the Project but is not intended to limit the Applicant's liability for subsidence compensation.

88. The risk of potential early mine closure and the potential for the Applicant to default on its subsidence compensation obligations were raised in multiple submissions. Regarding the ongoing liability for subsidence compensation, section 8 of the CMSC Act provides:

> *(1) Compensation under this Act is to be paid—*
>
> *(a) by the proprietor of the coal mine that caused the subsidence—in relation to compensation arising from an active coal mine, and*
>
> *(b) by the Chief Executive from the Fund—in relation to compensation arising from a non-active coal mine.*
>
> *(2) If a person ceases to be a proprietor of an active coal mine (whether by reason of sale, transfer, the coal mine ceasing to be active or any other reason), the proprietor remains liable to pay compensation in relation to any claim that has been made under this Act but has not been finally determined.*
>
> *(3) Subject to subsection (2), a person who becomes a proprietor of an active coal mine (whether by reason of purchase, transfer or any other reason) is liable to pay compensation under this Act in relation to subsidence arising from the coal mine (whether occurring before or after that time).*

89. Section 6.2 of the Department's Assessment Report indicates that all subsidence compensation associated with the Project would be paid from the Coal Mine Subsidence Compensation Fund. For clarification, section 8(1)(b) of the CMSC Act above provides that compensation is only paid from the fund for non-active coal mines. Accordingly, the Commission considers that the CMSC Act adequately provides for ongoing subsidence compensation in the event of mine closure.

90. Multiple submissions raised concerns about potential impacts to infrastructure, including high-pressure gas lines, rail corridors, motorways, and sewage and water infrastructure. The Department's recommended condition C5 (Performance Measures – Built Features) imposes performance measures addressing safety, serviceability, repairability and compensation in relation to impacted infrastructure. Additionally, the Department's recommended condition A31 provides that the Applicant must repair or relocate, or pay for the repair or relocation, of any public infrastructure damaged as a result of the Project. The Commission is satisfied that the Department's recommended conditions will ensure that impacts of the Project on infrastructure are appropriately managed.

91. The Commission has considered Wollondilly Shire Council's concerns regarding potential subsidence impacts on the Bargo Waste Management Centre and notes that Council is the Environment Protection License holder for the Centre. The Department's recommended condition C14 requires the Applicant to establish a technical committee comprising of engineering and geotechnical specialists. The committee would assist the Applicant in meeting the obligatory subsidence impact performance measures set out in the Department's recommended condition C5. The Commission considers that the Department's recommended conditions are sufficient to ensure that the subsidence risks to the BWMC are appropriately managed.

92. The Commission has imposed an amended version of the Department's recommended condition A7 to require shortening of LW104B by 700 m from the commencement location (south-eastern end) in order to avoid subsidence related impacts to Dog Trap Creek. The reasons for this requirement are discussed further in section 8.2 of this Statement of Reasons.

93. Subject to the conditions of consent imposed by the Commission, the Commission finds that the subsidence impacts of the Project can be appropriately managed.

8.2 Surface Water

Public Submissions

94. Impacts to surface water were raised by speakers at the public hearing and in written submissions to the Commission, including the following issues:
    - pollution of surface waters from mine discharge, including Teatree Hollow, Bargo River (including Mermaid Pools) and the Nepean River;
    - subsidence impacts from mining under Dog Trap Creek;
    - unknown efficacy of the attempted creek-bed remediation; and
    - delayed commissioning of a wastewater treatment plant.

95. Dr Ian Wright, a senior lecturer at Western Sydney University, presented at the public hearing and provided a written submission on surface water impacts of the Project. Dr Wright made the following comments on subsidence-related impacts to surface water:

In my opinion, I expect that the Tahmoor Project is likely to have significant detrimental impacts on surface waterways due to long-wall induced subsidence and stream channel fracturing. Three of our university team (Katherine Morrison, Jason Reynolds, Ian Wright) have conducted research on the impact of long-wall induced subsidence and stream channel fracturing at Redbank Creek, in the Picton area, for more than six years. This creek has been exposed to long-wall subsidence from Tahmoor Colliery. Based on our research on Redbank Creek, I expect that a range of subsidence impacts from the Project on other streams are certain, and will probably include degradation of stream habitat, modification to natural flow regimes and impairment of water quality and stream ecology. I have not yet seen evidence that subsidence damage to fractured stream channels can be repaired.

96. Dr Wright also commented on the water quality impacts of wastewater discharged from the pit-top site, stating:

> *In my opinion, the Project will also continue to have water quality impacts on Bargo River through the ongoing Tahmoor Colliery wastewater discharged to Bargo River via Tea Tree Hollow. I consider that inadequate information on this activity was presented in any of the environmental assessment materials for the Project. I also understand from recent EPA notices that the coal mine intends to construct a new waste treatment facility, but EPA notices have been instructing Tahmoor Colliery to do this since 2011 (See EPA notice to Tahmoor Coal #1502304).*
>
> *Very little detail was available in the environmental assessment materials on the proposed wastewater treatment facility and a particularly important omission was the fate of the coal mine wastes ('brine') from the planned treatment plant. I am concerned that the cumulative impact of both coal mine waste and brine wastes are not clearly covered in adequate detail in the environmental assessment materials.*
>
> *We consider that it is an urgent issue that the Bargo River is currently heavily contaminated by the Tahmoor Colliery waste discharge.*
>
> *In my opinion, the Project is likely to have a significant impact on water quality, aquatic ecology, and hydrology of surface waterways through subsidence and fracturing of stream channels. Waste generated by the mine appears likely to continue to cause pollution of Bargo River and the upper Nepean River for years.*

97. In response to questions from the Commission during the public hearing, Dr Wright stated that the issues he had raised regarding water treatment, water discharge and water management performance could be appropriately addressed through requiring compliance with ANZECC water quality guidelines and related conditions of consent.

98. Katherine Morrison, a PhD candidate at Western Sydney University, spoke at the public hearing, presenting research on the impacts of subsidence on Redbank Creek. Ms Morrison found that subsidence has resulted in fracturing of bedrock, causing a loss of surface water in some locations, as well as interaction of surface and groundwater resulting in changes to surface water chemistry. Ms Morrison noted that the attempted remediation of Redbank Creek has not yet been proven to be effective, and the documented impacts should be given further consideration prior to any expansion of the mine.

99. Callum Fleming, a Masters student at Western Sydney University, presented research findings on the impacts of mine wastewater on the Bargo River. Mr Fleming's research found that mine discharge contributed to significant changes in water chemistry in Bargo River relative to baseline conditions, including exceedances of ANZECC water quality standards.

Environment Protection Authority's Position

100. The EPA wrote to the Applicant on 2 December 2020 with a Notice of Variation of Licence No. 1389. The EPA applied a condition to this license requiring installation of a pilot water treatment plant by 31 October 2021 and a final plant prior to commencement of secondary coal extraction in the Tahmoor South area. The condition also specified criteria for concentrations of pollutants for water treated by the plant.

101. The EPA in its meeting with the Commission identified longstanding water quality issues at the Tahmoor Colliery. The EPA stated that a water treatment plant was previously commissioned at the Site which effectively treated wastewater to a standard suitable for discharge, however, the plant ceased operating shortly after it was commissioned. The EPA noted that a new pollution reduction program is in place for the mine which directs the Applicant to achieve defined water quality limits for discharge into Teatree Hollow, in accordance with ANZECC water quality guidelines. The EPA also noted that water quality in the Bargo River was an important issue for the community.

Applicant's Position

102. The predicted subsidence-related impacts on watercourses are discussed in the Applicant's written submission to the Commission, which states:

> *As described in the subsidence assessment for the Project (MSEC 2020), where longwalls mine directly beneath streams, fracturing could occur to pools above these longwalls, resulting in surface water flow diversion from the stream bed to the strata beneath it. In some of these locations, fracturing could affect the holding capacity of the pools. The key point however, in terms of the impact to surface water resources, is that it is very unlikely there would be any net loss of water from the catchment, since any redirected flow would not intercept any flow path that would allow the water to be diverted into deeper strata or the mine. That is, the lack of surface to seam cracking means that water would not be lost to the underground mine workings or deep strata, but rather would re-appear downstream in the catchment. This is consistent with what has been observed in Tahmoor North.*
>
> *Further to this, if cracking and diversion of water in any pool because of the Project occurs, Tahmoor Mine has developed a remediation process which will be implemented to ensure that the cracking is appropriately remediated, and the creek bed restored to its pre-mining condition. In this regard, Tahmoor Mine has worked closely with the Resources Regulator to develop a remediation process for creeks affected by subsidence. This process involves grouting the cracks which, along with natural sealing processes that occur through sediment infilling, has proven successful in retaining pool water in the trials at Redbank Creek and Myrtle Creek. This remediation process is continually being improved, based on the experience in Tahmoor North.*

103. The assessment of subsidence induced fracturing of pools presented in section 6.4 of the Department's Assessment report states that 17 pools were located above or adjacent to the end of LW103B and that HEC predicted that many of these pools had a high likelihood (40% or greater) of impact. The Applicant's written submission to the Commission included a response to this assessment by the Department, stating:

> *The likelihood of a "Type 3" impact was based on subsidence predictions by MSEC (2020). 7 of 62 pools with 40% or greater likelihood of a "Type 3" impact are not considered to be "many". The 7 pools do not overlie nor are they adjacent to the southern end of LW103B - they overlie 101B and 102B. Refer to Figure 20 in the DPIE assessment report.*

104. The timeline for the commissioning of a new water treatment plant and sewage treatment plant is discussed in RRFI2, which states:

The commissioning of the new Water Treatment Plant and the pit top Sewage Treatment Plant is planned to occur prior to the commencement of secondary extraction in Tahmoor South. Additionally, Tahmoor Coal is investigating options for the utilisation of the treated water on site.

105. Options for the disposal of brine from the wastewater treatment plant are discussed in RRFI3. It is noted that the wastewater treatment plant does not form a part of the Application. RRFI3 states:

The WWTP is predicted to produce approximately 300 – 500 kL of brine per day. A range of options have been considered for storage, management and disposal of the brine and short-listed to the following:

a. Disposal of the brine to a newly built facility located at Port Kembla, with subsequent discharge into adjacent sea water.

b. Disposal of the brine to historical Tahmoor Mine underground works.

106. The Applicant made a written submission to the Commission in February 2021 in response to issues raised in the Department's Assessment Report, the Commission's stakeholder meetings and in the public hearing. An update on the wastewater treatment plant was provided in the Applicant's written submission to the Commission, which stated:

Tahmoor Coal has issued a specification for the design and construction of the new WWTP, with the pilot plant anticipated to be in operation by October 2021. The specified WWTP target water quality is to meet the relevant ANZECC guidelines.

Department's Position

107. Surface water impacts of the project are assessed in section 6.4 of the Department's Assessment Report, which states:

The Department accepts that the surface water impact assessment has been based on up-to-date streamflow and water quality data and calibrated to an acceptable level of accuracy using actual data from Tahmoor North operations. However, the Department considers the surface water modelling should be validated in the future, when additional data from ongoing monitoring and investigations is available, and has recommended a condition requiring this be done as part of the SWMP.

The Department considers that there are sufficient entitlement shares within the Surface Water WSP to allow Tahmoor Coal to purchase WALs to account for its surface water (baseflow) take.

The Department accepts that the Project may result in subsidence induced impacts to some pools, including flow diversions and reduced pool holding capacity. Surface water along watercourses may also be locally impacted by iron and other constituents from fractured creek beds, ferruginous springs and strata gas emissions. However, the Department is confident that watercourses can be remediated and has recommended remediation activities along watercourses be implemented if impacts occur.

The Department accepts that controlled water discharge volumes associated with the proposed surface operations would be similar to existing volumes and that future mine water would be treated to a high standard via a new WTP.

The Department considers it important that potential surface water impacts are monitored, reported and validated via comprehensive surface water management plans, and has recommended conditions accordingly.

108. Section 2.2 of the Department's Assessment Report explains the Department's proposed conditions requiring shortening of longwall 103B to reduce subsidence impacts on Dog Trap Creek, stating:

> *…the Department considers that setting back the commencement end of LW103B by a relatively short length (i.e. 400m) would result in a clear material environmental benefit without compromising the economic viability of the Project. The 3rd order section of Dog Trap Creek is a well-defined valley and incised part of the landform that is predicted to experience the greatest non-conventional subsidence effects and subsidence impacts. The Department considers that substantial reductions in the likelihood of impact to a significant number of pools (17) and Aboriginal heritage sites (5), as well as a cliff line, along Dog Trap Creek would be achieved by shortening the longwall.*

109. The Department's decision to not require shortening of longwalls LW101B and LW104B is explained in section 2.2 of the Department's Assessment Report, stating:

> *The Department accepts that avoiding undermining sections of Dog Trap Creek above LW101B and LW104B would have significant economic implications, by sterilising substantial volumes of coal, for reduced environmental benefits (i.e. a reduced likelihood and risk of impacts to fewer pools and Aboriginal heritage sites). The Department has therefore recommended the lengths of these longwalls remain unchanged.*

Commission's Findings

110. The Commission notes that prior to design of the longwall configuration in the original application, there was a thorough analysis of risks and constraints, including identification of watercourses, major cliffs, cliff risk management zones, stream risk management zones, reserved lands, the Metropolitan Special Area, and major infrastructure, such as roads and railways. This is summarised in figure 5.3 of the EIS. This analysis identified from the outset that Dog Trap Creek is a 3rd order stream, within a stream risk management zone.

111. The Commission viewed a section of Dog Trap Creek from Bargo Road Bridge during the site and locality visit, as well as examples of remediation within Redbank and Myrtle Creek.

112. The Commission acknowledges that the Applicant has identified instances where remediation has led to improved water retention in subsidence-damaged sections of Redbank Creek and Myrtle Creek; however, data is not available on the long-term efficacy of the Applicant's adopted creek-bed remediation methodology.

113. The Department's recommended condition A7 would require the Applicant to reduce the length of LW103B by 400m to reduce subsidence impacts to Dog Trap Creek. The Applicant's written response to the Commission disputes the Department's assessment of the impacts of LW103B on Dog Trap Creek, noting that the seven worst affected pools are located above LW101B and LW102B, not the south-eastern end of LW103B. The Commission notes that the pools referred to by the Applicant are located on Tributary 1 of Dog Trap Creek, whereas the Department is seeking to avoid impacts to the 3rd order sections of Dog Trap Creek based on advice from BCS. The Commission agrees with the Department's conclusion that LW103B should be shortened to reduce environmental impacts.

114. The Department did not recommend shortening longwalls LW101B or LW104B, based on the economic implications of sterilising coal reserves, having regard to the lesser relative environmental benefits of doing so. Regarding LW101B, the Commission agrees with the Department's position that it would not be appropriate to require shortening of the longwall, as the Applicant has stated that it would cause LW101B to be economically unviable without sufficient material environmental benefit. Regarding LW104B, the Commission acknowledges that the volume of coal left unmined would be significant, however the Applicant has not indicated that if longwall 104B were to be shortened, the longwall or the mine would become economically unviable. Shortening LW104B would avoid directly undermining eight stream pools and reduce the likelihood of impact to a further two pools, whilst sterilising 0.6Mt of product coal. Noting that the long-term efficacy of the Applicant's remediation methodology is uncertain, the Commission considers that it is appropriate to shorten longwall LW104B by 700 metres in addition to shortening LW103B to avoid the potentially significant subsidence impacts to Dog Trap Creek. The economic impacts of the sterilised coal resource are considered acceptable given the environmental impacts that would be avoided by doing so. The Commission has accordingly imposed a revised version of the Department's recommended condition A7 to require shortening of LW104B by 700 metres from the proposed commencement location.

115. The Department's recommended condition A8 would enable the Applicant to seek the Secretary's approval to vary the length of (shortened) LW103B by providing an extraction plan with detailed environmental and economic analysis. The Commission has amended recommended condition A8 to include LW104B, and added a requirement for the Applicant to consider and provide documentation about damage to any watercourse affected by subsidence of previously extracted longwalls and whether the damage has been successfully remediated. The Commission's amended condition would require the Applicant to demonstrate that any proposed variation of the commencement location would have no unacceptable residual impacts.

116. The Commission notes community concerns regarding water quality in Teatree Hollow and the Bargo River, including Mermaid Pools. The EPA has a pollution reduction program in place with specific targets for the water quality of mine water discharged into Teatree Hollow, including compliance with ANZECC water quality guidelines, and considers that these targets can be met using a reverse osmosis water treatment plant, which is a requirement of the Applicant's EPL.

117. The Commission notes that separate development consent will be required for the wastewater treatment plant including consideration of disposal options for concentrate.

118. The Commission agrees with the Department's position that water quality impacts associated with the discharge point into Teatree Hollow are adequately addressed by imposition of the Department's recommended condition B29, requiring commissioning of the water treatment plant prior to second workings.

8.3 Groundwater

Public Submissions

119. Impacts to groundwater were raised in both the public hearing and in written submissions to the Commission, including the following issues:

- impacts on bore water, which is relied on by many residents and businesses in the area;
- the potential for the Project to cause enduring groundwater impacts; and
- potential impacts on Thirlmere Lakes which is a groundwater-dependent ecosystem.

120. In response to a brief from the Australia Institute, Dr Phillip Pells presented at the public hearing and provided a detailed written submission on groundwater impacts in relation to the Thirlmere Lakes. Dr Pells made the following conclusion regarding the condition of Thirlmere Lakes and risks posed by the Project:

> *It is of no doubt that Thirlmere Lakes are significantly degraded, physically and ecologically, compared with the situation of the late 1990's. A consequence could be UNESCO adding the lakes to the list of World Heritage in Danger, leading to International scrutiny. This would be the only Australian site on the list, presently comprising 53 Properties. I consider this to be a very significant Consequence.*
>
> *My analyses covering 15 years of study and reviews suggest it would be found that that there is a reasonable probability (be it Low to Moderate) that the damage has been significantly exacerbated by loss of groundwater into the Tahmoor Colliery over four decades.*
>
> *It is not unreasonable to conclude that there is a High Risk of a finding that a World Heritage site in Australia has not been properly and adequately protected and "all efforts must be made to enable its removal from the List of World Heritage in Danger as soon as possible" (UNESCO)*

Applicant's Position

121. Potential impacts to Thirlmere Lakes are discussed in section 7.2.4 of the PAR, which states:

> *Thirlmere Lakes is a High Priority Groundwater Dependent Ecosystem listed in the relevant Water Sharing Plan. Despite there being some limited groundwater drawdown predicted in this area, the predicted changes in groundwater-surface water interaction and consequent reduction in surface water level due to the Amended Project are considered negligible. Cumulative effects of mining activities, including historical operations at Tahmoor Mine, have been modelled and quantified and assessed as being minor.*

122. The Applicant responds on potential impacts to the Thirlmere Lakes in the RRFI, stating:

> *Conservative predictions of groundwater drawdown at Thirlmere Lakes were made in the groundwater assessment that accompanied the PAR. Effects on the lake themselves were described in the surface water assessment as "negligible increase in… leakage" from the lakes to groundwater, and the consequent effect on lake levels "would be imperceptible and unmeasurable in the field and very small compared to natural variability".*
>
> *This finding is supported by the key finding from the NSW government's Thirlmere Lakes Research Program (TLRP) regarding the historical effects of mining at Tahmoor Mine, which is much closer to the lakes than Tahmoor South: This states "Current evidence does not show that the lake water levels are influenced by changes in the deep groundwater table (or nearby longwall mines)" (WRL 2020).*
>
> *Taken together, these conclusions indicate that there is no need to mitigate or offset impacts at Thirlmere Lakes due to historical Tahmoor operations or due to the Project.*
>
> *The final TLRP report is due in early 2021. In the case that the final report reaches different conclusions, there may be a need to consider mitigation options, however any effects are highly unlikely to be due to the more distant Project.*

123. In its meeting with the Applicant, the Commission asked why the Department had not accepted the advice from DPIE Water and NRAR that a revised groundwater model is needed before determination of the Application. The Department responded that, having considered advice from independent groundwater expert Hugh Middlemis, the issue was not considered to be determinative. The Department also noted that draft conditions were provided to DPIE-Water and NRAR for comment, and both DPIE Water and NRAR responded that they accepted the proposed timeframe in the draft condition, which was to develop the plan prior to construction commencing.

Department's Position

124. Groundwater impacts are assessed in section 6.3 of the Department's Assessment Report, which concludes:

> *The Department considers that there are sufficient entitlement shares within the Groundwater WSP to allow Tahmoor Coal to purchase WALs to account for its maximum groundwater take.*
>
> *The Department accepts that Tahmoor Coal has extensive experience managing subsidence and groundwater impacts from over 30 years of longwall mining in the area, including make-good measures for bores identified to be affected by mining. The Department accepts that the number of bores predicted to be impacted by the Project and potentially requiring 'make-good' provisions (10 'high' risk bores) is manageable.*
>
> *The Department considers that Project would result in relatively low risks of groundwater impact to Thirlmere Lakes. However, the Department considers it important that potential impacts are monitored, reported and validated via a comprehensive GMP, and has recommended conditions accordingly.*

125. In relation to preparation of an updated groundwater model, section 6.3 of the Department's Assessment Report states:

> *The Department accepts the recommendation from HS, Mr Middlemis and DPIE-Water that the groundwater model be reviewed and updated once additional information is available, particularly in relation to the Thirlmere Lakes Research Program. Given the research program is due to be completed in late 2021, the Department accepts that a 2-year timeframe for completing the model review is reasonable and has recommended a condition accordingly.*

126. Regarding predicted impacts to bore water, section 6.3 of the Department's Assessment report finds:

> *Overall, the Department accepts that due to conservative assumptions within the groundwater model and the availability of the existing drawdown (aquifer depth and yield), it is unlikely that the number of bores modelled to be impacted beyond the 2 m drawdown would result in 'makegood' provisions. However, both DPIE-Water and the Department acknowledge that there are likely to be adverse impacts, including reduced water supply and quality, to some privately-owned licensed bores in the vicinity of the Project.*

127. The Department's Assessment Report, at Table 3 (Key Components of Project), indicates that the Application includes transfer of water to and from the Tahmoor North goaf areas, as the table includes:

Excess mine water: transfer and return of excess mine water to and from the proposed underground storage areas within goaf areas of Tahmoor North using existing mine infrastructure (around 242 ML/year excess mine water with underground storage capacity of 4,725 ML).

Note: Tahmoor Coal must modify the existing development consent for the Tahmoor North Mine (67/98) dated 1999, or any other relevant consent, to obtain approval.

128. Table 24 of the Department's Assessment Report indicates that the transfer of water to and from the Tahmoor North goaf areas is not within the Project area:

The Department notes that as the proposed storage area is not within the project application area, in order for Tahmoor Coal to lawfully store any excess water from the Tahmoor South development in the underground goaf areas of the Tahmoor North Mine, the Applicant would be required to modify the existing development consent for the Tahmoor North Mine (67/98) to allow this activity.

129. Table 9 of the Department's Assessment Report includes advice from the IESC on wastewater storage within goaf areas, that stated:

If it is intended to store the waste water from coal washing and groundwater from dewatering activities in the goafed areas, further information is needed on the underground storage proposal.

130. The Department's recommended condition B31 (offsite mine water transfer) states:

This consent permits the transfer of water to and from the underground workings and goaf areas of the Tahmoor North Mine.

Commission's Findings

131. The Commission considers that the Department's recommended condition B31 appears to allow transfer of water to the Tahmoor North goaf area without further consent; however, it is clear from the Department's Assessment Report that separate consent is required as the storage in Tahmoor North goaf areas is beyond the boundaries of the Project Area. The Commission has accordingly imposed a condition indicating that the consent does not permit the transfer of water to and from the underground workings and goaf areas of the Tahmoor North Mine but also does not prevent appropriate consent being granted for such transfers of water.

132. The Commission has noted community concern regarding the potential impacts of the Project on the Thirlmere Lakes, which are within a National Park and part of the Greater Blue Mountains World Heritage Area. The Commission viewed the Thirlmere Lakes as part of the site and locality inspection. The Department's recommended condition B39 (water management plan) requires the Applicant to prepare a water management plan prior to construction commencing, including a requirement to utilise existing data from nearby mines and build on existing monitoring programs, where practicable. In considering updated data on the Thirlmere Lakes, if there is found to be a possibility of ongoing mining contributing to degradation of the ecosystem, the Commission considers that the Applicant should apply the precautionary principle and take necessary steps to prevent ongoing impacts. Accordingly, the Commission has included some changes to condition B39 to provide clarity around the monitoring programs and adaptive response.

133. The Commission agrees with the Department that the predicted groundwater impacts of the Project can be appropriately managed through the recommended conditions of consent, subject to the Commission's imposition of further conditions discussed above.

8.4 Biodiversity

Public Submissions

134. Presentations in the public hearing and written submissions to the Commission included concerns regarding potential impacts to Endangered Ecological Communities and damage to koala habitat. Concerns were also raised regarding impacts on platypus habitat.

135. A submission from community group the National Parks Association - Macarthur Branch questioned why the two proposed ventilation shafts (TSC1 and TSC2) are not co-located on one lot to minimise clearing.

Applicant's Position

136. Biodiversity impacts of the Project are discussed in section 6.5.3 of the SPAR, including the Shale Sandstone Transition Forest (**SSTF**) Critically Endangered Ecological Community (**CEEC**) which states:

> *The amended Project has significantly reduced impacts on terrestrial ecology, particularly threatened communities and species.*
>
> *The Project will now only impact 24.32 ha of native vegetation, of which 14.20 ha is mine rehabilitation. This is a reduction of 13.45 ha compared to previous impacts, all of which relates to SSTF where now only 10.10 ha will be impacted. Previously it was proposed to clear 23.57 ha of this CEEC. In addition, of the 10.10 ha of SSTF to be disturbed, 1.42 ha already has approval to be disturbed under existing approvals at Tahmoor Mine.*
>
> *…..*
>
> *Minor residual impacts to terrestrial ecology will be offset in accordance with the NSW biodiversity offset scheme.*

137. In its meeting with the Applicant, the Commission asked whether there was an opportunity to relocate the proposed ventilation shaft TSC2 onto the site of TSC1 to reduce clearing of the CEEC. The Applicant provided the following response in its written submission to the Commission:

> *The Project proposes the construction of two new ventilation shafts; an upcast shaft on land owned by Tahmoor Coal (TSC1), and a downcast shaft on Crown land (TSC2). Both ventilation shaft sites contain the critically endangered ecologically community (CEEC) Shale Sandstone Transition Forest, noting that it varies in condition from 'good' on the TSC2 Crown land site, to a derived form of lower condition on the TSC1 site.*
>
> *The question was asked of Tahmoor Coal at the meeting between the Commission and Tahmoor Coal as to whether the shafts could both be accommodated on Tahmoor owned land (ie on the TSC1 site), being the property with the lower condition CEEC.*
>
> *Tahmoor Coal has undertaken further investigations on this matter since the meeting, and while the current proposal is the preferred approach from a ventilation efficiency perspective, if required to do so, TSC2 could be constructed on the same site as TSC1. This would completely avoid clearing of the CEEC that is in good condition (2.8 hectares (ha)). The area of CEEC to be cleared for the Project would therefore reduce from 10.1 ha to approximately 7.3 ha.*

Notwithstanding the above, it is noted that the 10.1 ha proposed to be cleared by the Project in the second amendment report is a very small percentage of the 12,500 ha remaining of the CEEC.

Further, biodiversity credits are available on the market to retire to enable the offsetting of impacts to 10.1 ha.

Department's Position

138. The Department's consideration of impacts on koala habitat are provided in section 6.6 of the Department's Assessment Report, which states:

Whilst Koalas were not detected during field surveys, areas proposed for surface disturbance form part of a primary Koala corridor. Vegetation clearing would result in minor fragmentation of potential koala habitat. However, the BAR concludes that the proposed vegetation clearing would be unlikely to impede Koala movement as no potential barriers would be erected and extensive habitat exists in surrounding areas

However, due to the importance of this habitat in relation to broader regional Koala linkages, the Department has recommended that rehabilitation of disturbed areas include the re-establishment of habitat for the Koala, as well as other threatened fauna.

139. The Department's conclusion on both the terrestrial and aquatic biodiversity impacts of the Project are discussed in section 6.6 of its Assessment Report, which states:

The Department considers that the Project has been designed to avoid, mitigate and manage biodiversity impacts where practicable. However, the Project would result in a range of residual impacts on biodiversity through the disturbance of 24.3 ha of native vegetation, including CEECs, and threatened flora and fauna species listed under the BC Act and EPBC Act.

The Department has carefully considered these impacts on biodiversity values, and considers that they would be suitably managed, mitigated and/or offset under the recommended conditions of consent. Additionally, the retirement of ecosystem and species credits would sufficiently compensate for residual biodiversity impacts, in accordance with the BC Act.

Overall, the Department considers the impacts of the Project on biodiversity, including aquatic ecology, are acceptable.

Commission's Findings

140. The Commission viewed the location of the proposed ventilation shafts TSC1 and TSC2 during the site inspection. Although both sites include the Shale Sandstone Transition Forest CEEC, the Commission noted that the TSC1 site is predominantly cleared with few remaining trees, whereas the TSC2 site, which is located on Crown land, is more densely vegetated. The Applicant has stated that TSC2 could be constructed on the same site as TSC1 to completely avoid clearing of the 'good' condition CEEC. The Applicant noted that the proposed configuration is preferred from a ventilation efficiency perspective, that the amount of CEEC proposed to be cleared is small relative to the extent of the remaining CEEC, and that the impact can be offset. The Commission notes that advice from the BCS to the Department on the SPAR stated that any impacts to endangered entities, particularly the Shale Sandstone Transition Forest CEEC, should be avoided wherever possible. The Commission has accordingly imposed a condition of consent requiring relocation of the TSC2 vent and prohibiting clearing of what otherwise would have been the TSC2 site.

141. The required relocation of TSC2 is not expected to result in significant changes to the noise or air quality impacts of the Project. As described in the SPAR, TSC1 and TSC2 are relatively close and the proposed relocation of TSC2 in the recommended condition B37 is essentially improved micro-siting to minimise biodiversity impact.

142. Noting that the relocation of TSC2 will avoid clearing of 2.8 hectares (ha) of the CEEC, the Commission has also imposed an amended version of the Department's recommended condition B36 (biodiversity credit requirements) to allow for recalculation of the credits to account for the reduction in clearing, to the satisfaction of the BCT.

143. The Commission notes that the Department recommended that rehabilitation of disturbed areas include the re-establishment of habitat for the Koala, as well as other threatened fauna. The Commission considers that this approach should also be adopted during mine operations where possible. The Commission has therefore imposed an amended version of the Department's recommended condition B37 to accommodate re-establishment of habitat for the Koala, as well as other threatened fauna within the required Biodiversity Management Plan.

144. The Commission notes that the BCS, in its advice to the Department on the PAR, recommended further amendments to longwalls LW101B, LW103B and LW104B to avoid directly undermining Dog Trap Creek. As discussed in section 8.2 of this Statement of Reasons, the Commission has imposed an amended version of the Department's recommended condition A7 to require shortening of LW104B in addition to LW103B.

145. Subject to the imposed conditions of consent, the Commission agrees with the Department's finding that the predicted biodiversity impacts of the Project are acceptable.

8.5 Air Quality

Public Comments

146. Air quality impacts were raised in presentations at the public hearing and in submissions to the Commission by residents near to the pit top site and the existing ventilation shaft. Issues raised included odour and air pollution from ventilation shafts, coal dust from the pit-top site and dust from the Reject Emplacement Area.

147. One written submission was received regarding coal dust at the Wollondilly Anglican College, which is a pre-kindergarten to year-12 school, stating:

> *Coal dust was very common at Wollondilly Anglican College when I attended from 2007 to 2018; however, we were all completely unaware of what it was and the dangers that is posed to us as young children as well as the adults.*

148. Another written submission raised concerns regarding odour impacts from one of the mine's existing ventilation shafts, stating:

> *I live near the existing Vent Shaft T2, which would continue to be used if the project is approved. When the wind blows in my direction, it smells horrendous you can't sit outside or have any windows open. The 99th percentile odour prediction is 7 odour units (OU), which is very high! That level is what is considered 'appropriate' by the EPA for populations of 2 people, but there are probably at least 40 residences nearby so 7 OU is not appropriate!*

Wingecarribee Shire Council's Position

149. Wingecarribee Shire Council provided written advice to the Department on the EIS and requested that the Department consider requiring covered wagons as a condition of consent, to minimise the effect of coal dust on growing population centres.

150. In the Commission's meeting with Wingecarribee Shire Council, the Council noted that the Department had not recommended covered wagons as a condition of consent. The Council restated its position that wagons should be covered to minimise the escape of coal dust during transit and noted that these trains pass through the major population centres of Mittagong, Bowral and Moss Vale and the villages of Yerrinbool, Aylmerton, Balaclava and Robertson.

Environment Protection Authority's Position

151. The EPA provided written advice to the Department on air quality impacts in relation to the EIS, PAR and SPAR. The EPA advice on the EIS recommended conditions requiring a construction Air Quality Management Plan and an updated operational Air Quality and Greenhouse Gas Management Plan. The EPA also recommended additional real-time PM_{10} monitors to enable adaptive real-time management of air quality impacts, and that the network should target the most sensitive receptors including the Wollondilly Anglican College and nearby residences on Remembrance Driveway.

152. In relation to the PAR, the EPA advised that the Air Quality impact assessment satisfactorily met the EPA's guidelines, and provided no further recommendations.

153. In relation to the SPAR, the EPA advised that the proposed changes did not substantially alter the anticipated impacts already considered by the EPA and no further comments were made.

154. In the Commission's meeting with the EPA, the Commission requested the EPA's advice on air quality criteria. The criteria specified in the Department's recommended condition B11 include annual and 24-hour criteria for PM_{10} and $PM_{2.5}$ concentrations at private residences. Whilst the annual criteria address total concentrations including background levels, the 24-hour criteria account for incremental impacts from the development only, and do not include background concentrations. The Commission noted that National Environment Protection (Ambient Air Quality) Measure standards apply to total concentrations, and also raised the potential difficulty of isolating incremental impacts in a 24-hour window. The Commission requested the EPA's advice on the appropriate criteria for 24-hour average concentrations. The EPA responded:

> *…the sensible way that we think this should be conditioned and regulated is as you describe, and that the NEPM health levels are defined, which include existing – I'll call it background levels of particle pollutants, plus anything that is generated from the new development, the expansion of the mine.*

Applicant's Position

155. Air quality impacts from the project are addressed by the Applicant in Appendix N and section 11.11.7 of the EIS, Appendix J and section 7.9.4 of the PAR, and section 6.8.1 of the SPAR.

156. Section 11.11.7 of the EIS summarises the predicted air quality impacts of the Project as follows:

> *…..Estimated PM_{10} emissions from construction of the proposed development as a whole would be significantly less than the estimated emissions for operational mining activities.*
>
> *Operation of the proposed development is not predicted to result in exceedances of air quality criteria for annual average $PM_{2.5}$, annual average PM_{10}, annual average TSP or annual average deposited dust under the worst case scenario, when considering project only contributions or when including cumulative (background) contributions.*

No sensitive receptors are predicted to exceed the maximum 24-hour $PM_{2.5}$ criterion of 25 µg/m^3 as a result of the proposed development (project-only contributions).

One private receptor near the REA (R10) is predicted to experience maximum 24-hour average PM_{10} concentrations above the criterion of 50 µg/m^3, due to the proposed development's operations alone. This receptor is predicted to exceed the 24-hour average impact assessment criterion on only one day of the year as a result of emissions from the proposed development.

Assessment of cumulative PM_{10} 24-hour impacts concluded that there was a probability that the selected receptors may exceed the EPA criterion of 50 µg/m^3 when impacts are considered cumulatively. Receptor (R10) had the highest estimated number of days exceeding the 24-hour average PM_{10} criterion (up to 9 days per year). However, with the incorporation of the TARP and other dust management practices, these exceedances would be well managed.

157. Air quality impacts from flaring and mine ventilation are discussed in Appendix J of the PAR, which states:

The potential NO_2, CO and HC impacts from flaring were all well below their respective EPA criteria. Odorous emissions from the ventilation vents were considered and the results indicate that the 99th percentile odour concentration limit of 7 ou will not be exceeded at the nearby residences. However, there may be peak periods where higher concentrations of odour may be detected at the closest receptors from time to time.

158. Section 7.9.4 of the PAR states:

There are no sensitive receptors that are predicted to experience annual average $PM_{2.5}$, PM_{10}, TSP concentrations or dust deposition levels above the EPA assessment criteria, either from the Amended Project alone or cumulatively.

A Monte Carlo Simulation was completed to assess cumulative PM_{10} 24-hour impacts at the most affected receptor locations. The privately-owned receptor with the highest estimated number of days exceeding the 24-hour average PM_{10} criterion was at R1, with exceedances of the cumulative criteria predicted to be exceeded on up to 5 days of the year. However, with the incorporation of the TARP and other dust management practices, these exceedances would be well managed.

There are unlikely to be any additional exceedances of the cumulative 24-hour $PM_{2.5}$ criterion due to the Project. Measured exceedances are the result of regional events such as bushfires and hazard reduction burns and the contribution from the Amended Project is low.

When comparing with results from the EIS, the results for the Amended Project were identical or a very small percentage higher. There has not been a change to the conclusions with no sensitive receptors exceeding the relevant impact assessment criteria.

159. The air quality impacts were considered further in section 6.8.1 of the SPAR, which noted that amendments in the SPAR did not increase the mine's production limits and would not result in any changes to particulate emissions, stating:

The Air Quality Impact Assessment (AQIA) (ERM 2020a) completed by ERM that accompanied the PAR (AECOM 2020b) included dispersion modelling for a maximum ROM throughput of 4 Mtpa. The Project is not proposed to exceed this production rate and would therefore not result in any changes to particulate emissions associated with these activities.

One of the main sources of dust emissions for the Project is wind erosion from the REA, accounting for approximately 10 per cent of the total emissions from the site. As this footprint will reduce in size this will result in a reduction in dust emissions at the REA. In addition, the increased height of the REA will not increase the dust emissions.

It is therefore anticipated that the Project is not likely to result in any increases in particulate emissions or ground level concentrations compared to those presented in ERM (2020a).

Department's Position

160. The Department addressed Air Quality in Table 24 (Other Issues) of its Assessment Report, and made the following recommendations:

- *The Department has recommended a condition to address EPA's concerns about mitigating cumulative particulate emissions at receptors located in the Olive Road area.*
- *The Department has recommended that Tahmoor Coal take all reasonable steps to minimise odour emissions from the ventilation shafts and that these steps are documented and managed under the recommended Air Quality and Greenhouse Gas Management Plan. The recommended conditions also require that no offensive odour is emitted from the site.*
- *The Department has also recommended other robust and contemporary air quality management conditions, including requirements to:*
    - *minimise particulate matter, odour and fume emissions, including during adverse weather conditions; and*
    - *undertake continuous air quality monitoring (including the establishment of at least two new PM_{10} monitors near sensitive receivers proximal to the surface facilities site) to ensure compliance with the air quality criteria.*

161. Regarding odour impacts from the existing T2 ventilation shaft, Table 24 of the Department's Assessment Report states:

The odour modelling predicted that the Project would comply with applicable odour criteria for all receivers. However, given a higher population density around the T2 ventilation shaft site odour levels are predicted to be around the odour criteria at Receiver R8. The Department notes that this would be alleviated once the T2 shaft is reduced to one fan.

162. Wingecarribee Shire Council's concerns regarding dust from coal trains were noted in Table 8 (Agency Advice) of the Department's Assessment Report, which states:

- *Tahmoor Coal committed to water spraying of the coal services during train loading, as well as best proactive load profiling to ensure fugitive dust emission* (sic) *are minimised.*

and:

- *The Department accepts that assessed levels of dust from coal wagons is minor.*

163. The EPA's recommendations regarding air quality were addressed in Table 8 of the Department's Assessment Report. The Department notes that it has responded to the EPA's advice by recommending conditions which:

- set strict air quality criteria;
- require additional air quality monitors at sensitive receivers, and;
- require preparation and implementation of an Air Quality and Greenhouse Gas Management Plan.

164. The Department concludes in Table 24 that:

> *Subject to the recommended conditions, the Department considers that the air quality impacts of the Project are acceptable.*

Commission's Findings

165. In the Commission's meeting with the EPA and Department, the Department advised that its proposed air quality conditions were the result of a significant review process. The Department also noted that the recommended condition B11 is consistent with the *Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments* (**VLAMP**). The EPA informed the Commission that altering the criteria for 24-hour PM_{10} and $PM_{2.5}$ average concentrations such that they apply to total concentrations would be the EPA's preferred approach. The Commission has accepted the Department's advice and has had regard to the EPA's preferred approach in imposing conditions on air quality.

166. The Commission notes that the Department's recommended condition B11 applies to residences on privately owned land but does not address non-residential receivers, such as the nearby Wollondilly Anglican College. The Commission considers that the air quality criteria should apply to all sensitive receivers and has therefore imposed an amended version of the Department's recommended condition B11 accordingly. This amendment is consistent with NEPM guidelines which address human health criteria irrespective of the receiving land use.

167. Regarding odour impacts of the existing T2 vent, the Commission notes that the proposal to reduce the number of operating fans from one to two is expected to ensure odour levels remain below applicable criteria at all sensitive receivers. The Commission notes that the Department's recommended condition B14 (Air Quality Operating Conditions) includes a requirement to minimise odour emissions of the development, particularly from ventilation shafts. The Commission considers that condition B14 as recommended is adequate to ensure that odour levels from the Site are maintained within the applicable criteria at all sensitive receivers.

168. Subject to the imposed conditions of consent, the Commission agrees with the Department's finding that the Project would not cause unacceptable air quality impacts.

8.6 Noise

Public Submissions

169. The noise impacts of the Project, and the existing operations, were raised in written submissions to the Commission, and included noise from traffic, coal trains, and the pit-top site. One submitter noted that the noise impacts to their property had been exacerbated by bushfire, which removed much of the intervening vegetation which had previously acted as a sound barrier between the site and their property. Submissions also reported instances of shaking windows in residences and attributed this to mining activities.

Environment Protection Authority's Position

170. The EPA provided written advice to the Department in relation to the EIS, PAR and SPAR, that included advice on noise impacts. The EPA advice on the EIS stated that the EIS did not adequately address the SEARs and EPA's specific requirements, including in regard to low frequency noise and application of the VLAMP. The EPA provided detailed advice regarding the additional assessment required, including on low frequency noise, modelling and predicted impacts, mitigation and VLAMP, existing mine noise, sleep disturbance, background noise impacts and vibration.

171. In relation to the PAR, the EPA advised that many of the above issues had been resolved, and recommended conditions to assess and manage the effectiveness of the Applicant's proposed noise mitigation strategies and residual noise levels. Regarding low-frequency noise, the EPA advised that a 10dB reduction should be sought, excluding any penalty correction for low frequency noise when assessed in accordance with Fact Sheet C of Noise Protection for Industry (2017). The EPA also recommended that requirements for all reasonable and feasible noise mitigation, including negotiation with affected receivers, be imposed as conditions. Finally, the EPA recommended conditions requiring the Applicant to complete the proposed noise mitigation works within the three-year timeframe nominated by the Applicant.

172. In relation to the SPAR, the EPA advised that the proposed changes did not substantially alter the anticipated noise impacts already considered by the EPA and no further comments were made.

173. In the Commission's meeting with the EPA, the EPA noted the difficulty of mitigating low-frequency noise impacts. The EPA also provided background on noise impacts from the operation of Tahmoor Mine, stating:

> *In terms of Tahmoor Colliery, the main issues for us over the last five, perhaps 10 years has been a low-frequency noise causing problems and concerns for the local community, particularly in Olive Lane. This was coming from the washery, and it was assessed over many years, and there was a number of mitigation works installed to try and deal with that. It couldn't – it wasn't possible to get it to a level that it complied with assessments under the Industrial Noise Policy, and it was agreed that if there was ever a redevelopment of the mine, that would be the appropriate time to deal with those issues.*

Applicant's Position

174. The Applicant addresses potential noise impacts in section 11.10.6 of the EIS, which states:

> *It is expected that both the frequency and level of maximum noise events from the proposed development will be lower compared to the existing operation due to the mitigation measures to be implemented as part of the proposed development. Operation of the proposed development during the night-time is likely to result in maximum noise events below those likely to cause awakening reactions and satisfy the relevant maximum noise level screening criteria.*

175. Noise impacts of the Project are discussed further in section 7.8.4 of the PAR, which states:

> *The NVIA for the Amended Project indicates that operational noise from Tahmoor Mine will improve as a result of the project with the incorporation of feasible and reasonable mitigation measures especially during the most sensitive night-time period.*

Construction noise associated with the amended project is expected to increase general operational noise emissions in the vicinity of the proposed works; new ventilation shaft sites south of the REA. Tahmoor Coal will incorporate feasible and reasonable measures to minimise potential construction noise impacts and actively manage construction activity through the preparation and implementation of a Construction Management Plan.

176. Further project amendments and the resulting changes to noise impacts are addressed in section 6.7.2 of the SPAR which states:

EMM has undertaken an assessment of the potential noise impacts associated with the amendments to the Project. They result in negligible (up to 2 dB) change to the noise impacts presented in the NVIA (EMM 2020a).

Notwithstanding this, consistent with findings presented in the NVIA, the Project, inclusive of the amendments, is expected to reduce noise emissions at all assessment locations compared to existing levels by at least 2 dB and by up to 11 dB at assessment locations during the more sensitive night-time period

177. The Commission questioned the timing for completion of proposed additional noise attenuation measures during its meeting with the Applicant. The Applicant stated:

So the original commitment or the commitment we've made was to make those improvements within a three-year period from project approval. Taking into account the concern and the timeframes in the DPIE assessment report, we've done some further critical review of those timeframes. There is a significant amount particularly with respect to the acoustic treatment for the coal prep plant, the equipment improvements and the conveyor extension with the tripper installation and to complete those particular items – and they are major projects within themselves – there are some significant project management processes that need to be completed such as finalising the engineering designs, the tendering processes, contract negotiations and awarding, procurement of specialised equipment and installation and commissioning.

So there is a significant amount of work to be done. However, in saying that, after doing a further critical review we are able to commit that based on a determination in sort of quarter 4 of FY21 that we would be able to complete those works by quarter 4 FY23. So generally in alignment with the DPIE assessment report's recommendation.

Department's Position

178. The background of noise impacts from the Tahmoor Mine and the effect of Pollution Reduction Programs (**PRP**) are discussed at section 6.5 of the Department's Assessment Report, which states:

The site has been subject to noise complaints throughout its years of operation, the highest recorded in 2010 with over 90 complaints. The frequency of complaints has generally declined since 2010 coinciding with the implementation of PRPs. Complaints have predominantly related to vent shaft operations and pit top activities, night-time operations and peak noise level events.

179. Section 6.5 of the Department's Assessment Report includes the following conclusions on noise impacts from the Projects:

With the exception of specific noise limits associated with construction activities, the Department considers that Tahmoor Coal should continue to operate under existing noise limits specified in the Tahmoor 1994 consent, for a period of up to two years.

Subsequently, the Department considers it reasonable to require the implementation of all the proposed mitigation measures and the application of contemporary project noise limits in accordance with the NPfI.

While the Project is predicted to result in exceedances of PNTLs at 119 receiver locations, there would be a significant reduction in the number and severity of PNTL exceedances in comparison to existing operations (209 exceedances). Additionally, the majority of exceedances would be very minor and imperceptible.

Marginal / moderate and significant exceedances are predicted to occur at 47 receivers, which could be managed through proactive and reactive noise management on site, in combination with at-receiver mitigation treatments, upon request.

Lastly, the one significantly impacted receiver would be eligible for acquisition upon request, noting that under the existing operations, 6 receivers are predicted to be significantly impacted.

Overall, the Department considers that noise associated with the Project could be managed through stringent conditions of consent, including a pro-active and re-active noise management system, regular noise monitoring, and continued investigation into methods to reduce noise generated by the development.

180. Section 6.5 of the Department's Assessment Report also notes that:

. . . Noise levels at three of the remaining four receivers (Receivers 970, 975, 1028 and 1430) are predicted to exceed the PNTL by 3 dB or greater, and as such, the Department considers that these receivers are eligible for mitigation rights in accordance with the VLAMP

Commission's Findings

181. The Commission notes that proposed noise mitigation measures, once implemented, are expected to achieve a reduction in noise impacts relative to current operations, as stated by both the Applicant and Department. However, in absolute terms, the predicted noise impacts include 47 exceedances of Project Noise Trigger Levels (**PNTL**s).

182. Although the EPA has highlighted the difficulties of mitigating low frequency noise impacts from the pit-top site, the Commission notes that the EPA has reaffirmed its position that noise impacts from the Project can be appropriately managed.

183. The Commission has noted the Department's recommended conditions relating to acquisition on request (one property) and mitigation on request (50 properties) and finds that these conditions, in combination with the recommended conditions relating to noise operating conditions and noise criteria, are generally adequate to address the predicted noise impacts from the Project.

184. The Application did not predict exceedances of the PNTLs for the Wollondilly Anglican College and Wollondilly Anglican Community Church and the Department did not include noise criteria for these receivers in its recommended conditions. To ensure all reasonable and feasible measures are taken to address any potential exceedances, the Commission has added the PNTLs for these receivers as noise criteria in the conditions of consent. To ensure the noise criteria can be appropriately monitored and enforced, the criteria added for the college and church are external PNTL's only.

185. The Commission finds that, subject to the imposed conditions, including particularly the completion of noise attenuation measures within two years and the addition of noise criteria for the school and church, the Project will not cause unacceptable noise impacts.

8.7 Aboriginal Cultural Heritage

Applicant's Position

186. Aboriginal cultural heritage impacts are addressed in section 11.8.6 of the EIS, which states:

> *The ACHA identified that the majority of potential impacts on cultural heritage sites are limited to potential subsidence impacts, in particular to rock shelters which are more likely to experience adverse impacts that could result in harm such as increased rock falls and cracking. One archaeological site of low scientific significance (an open camp) falls within the footprint of a ventilation shaft and may be impacted directly.*

187. An updated assessment of Aboriginal cultural heritage impacts was provided in section 7.6.4 of the PAR, stating:

> *One Aboriginal cultural heritage site (an open camp site) assessed to be of low significance has the potential to be impacted by surface disturbance works and subsurface works as a result of construction of a proposed new ventilation shaft. Thirty (30) sites have the potential to be impacted by subsidence impacts. Due to the change in the Project layout there has been a minor change to the predicted subsidence within the Project area. This minor change has not altered any of the management and mitigation measures outlined in the ACHA that was included as Appendix L of the EIS. Impacts to Aboriginal cultural heritage would be managed through the implementation of an AHMP, and in consultation with the Aboriginal community.*

188. The SPAR identified no material changes to Aboriginal cultural heritage impacts.

189. The Applicant's RRFI included a response to Heritage NSW's recommendation to shorten Longwalls 101B and 103B, stating:

> *If monitoring detects the early development of potentially severe differential movements at the sites, the commencing position of Longwall 103B could be shortened.*
>
> *Tahmoor Coal has committed to documenting these adaptive management measures in a heritage management plan (HMP) which will be prepared prior to any mining being undertaken in the Tahmoor South Project area.*
>
> *As stated in the second amendment report, it is now considered that the Project provides the best balanced outcome, taking into account and balancing the benefits and impacts of the Project. Reducing the length of LW101B and LW103B would further reduce ROM volumes by around 1 Mt impacting resource recovery and benefits to local, regional and NSW economies.*

Department's Position

190. Table 24 of the Department's Assessment Report stated:

> *In response to concerns raised by BCS that there was insufficient avoidance of potential impacts to 3rd order streams, the Department has recommended that Longwall 103B be further amended to avoid mining directly below Dog Trap Creek, with the commencing position to be reviewed by the Planning Secretary, subject to further stream/riparian features assessment.*

As discussed in Section 2.2, this recommendation would result in significant environmental benefits while maintaining the economic viability of the Project. It would reduce the likelihood of impacts to 17 pools, avoid directly undermining a further 2 Aboriginal heritage sites and reduce the risk of impact to an additional 3 Aboriginal sites.

The Department has also recommended conditions to ensure the Project's impact on Aboriginal cultural heritage is appropriately managed, including:

- specific subsidence performance measures for all identified heritage items;

- the preparation of a Heritage Management Plan under each Extraction Plan; and

- operating conditions regarding protection of Aboriginal heritage including requirements for unexpected finds.

Overall, the Department recognises that the Project has the potential to impact a number of Aboriginal heritage sites within the SSA. However, it is considered that these impacts can be appropriately managed and mitigated subject to the recommended conditions.

Commission's Findings

191. The Commission notes that the potential impact to one Aboriginal cultural heritage site (an open camp site) has been avoided through relocation of ventilation shaft TSC2, as discussed in section 8.4 of this Statement of Reasons. The Commission considers that avoidance of impacts to other Aboriginal cultural heritage sites and proposed strategies to mitigate impacts which do occur have been appropriately managed in the development of the mine plan for the Project. The Commission agrees with the Department's finding that the Project's impact on Aboriginal cultural heritage can be appropriately managed through the imposed conditions of consent.

8.8 Historic Cultural Heritage

Applicant's Position

192. Historic heritage impacts of the project are addressed in section 11.9.6 of the EIS, which states:

A total of 23 historical heritage items were identified during the assessment, with 19 located directly above the proposed longwall mining area. The assessment concluded that there was nil to low likelihood of physical impacts to all masonry or timber heritage items, and that any impacts are predicted to be minor. Mitigation measures have been identified to manage potential impacts, including the preparation and implementation of a site-specific Heritage Management Plan for each heritage site of State/ local significance identified within the SSA.

Heritage values of Wirrimbirra Sanctuary, which is listed on the State Heritage Register, are not expected to be reduced by the proposed development. However, additional assessment of the Sanctuary would be undertaken prior to mining and would inform the preparation of a site-specific Heritage Management Plan and Statement of Heritage Impact in consultation with approved guidelines, the landowner (National Trust of Australia) and the NSW Heritage Council or its delegate.

193. An updated assessment of heritage impacts is provided in section 7.7 of the PAR, which states:

Overall subsidence predictions associated with the amended mine plan have reduced at all identified heritage sites within the amended subsidence study area, except for Item 10 (Cottage at 91 Hawthorn Road), where a minor increase in subsidence levels is predicted. A small increase in the predicted maximum subsidence is also predicted at a shed located within Wirrimbirra Sanctuary (from a range of 850-1150 mm to 900-1300 mm). Although the predicted maximum tilt, final tilt, total hogging curvature and total sagging curvature within the property are predicted to be less. Notably, overall maximum subsidence across the property is predicted to be less than the predicted levels associated with the EIS mine plan.

Department's Position

194. The Department's assessment of the heritage impacts of the Project is included in Table 24 of the Department's Assessment Report, stating:

> *The Department has recommended a number of conditions to ensure the Project's impact on heritage features are appropriately managed, including:*
>
> - *specific performance measures for all identified heritage items, including the Wirrimbirra Sanctuary;*
> - *the preparation of a Heritage Management Plan under each Extraction Plan, including pre and post mining condition assessments of heritage items within the SSA; and*
> - *TARPs for all natural, heritage and built features subject to specific performance measures.*
>
> *Overall, the Department recognises that the Project has the potential to impact a number of heritage items within the SSA. However, it is considered that these impacts can be appropriately managed and mitigated subject to the recommended conditions.*

Commission's Findings

195. The Commission notes that mining is proposed directly beneath the Australian Wildlife Sanctuary (formerly known as the Wirrimbirra Sanctuary), which is owned and managed by the National Trust of Australia (NSW) for conservation purposes and listed in the NSW State Heritage Register. The National Trust objected to the Application in its submission to the Department on the EIS, noting that the sanctuary is for the development and promotion of the understanding and appreciation of Australian native flora and fauna, and the predicted loss of surface water presented a significant risk to the sanctuary's biodiversity value.

196. Heritage NSW advised the Department that it remained concerned that the Project would cause long-term impacts to Wirrimbirra Sanctuary and recommended relocation of the proposed longwalls outside the State Heritage Register area, including a buffer zone. Heritage NSW was invited to meet with the Commission, but the invitation was not accepted. The Commission visited the Wirrimbirra Sanctuary as part of its site and locality inspection and viewed the existing built structures and noted the impacts of the recent bushfires.

197. In its meeting with the Department, the Commission questioned the appropriateness of undermining of a State Heritage item, noting that Heritage NSW had advised that no mining should occur beneath the sanctuary. The Department responded that the sanctuary is centrally located amongst multiple longwall panels and avoiding undermining in this location could make the longwall panels 103A and 104A economically unviable to develop and would raise questions about the viability of the entire Project. The Department also noted that the Applicant is required to remediate subsidence-related impacts and that the sanctuary is located in a longstanding mine subsidence district. Finally, the Department noted that there are precedents of State Heritage items that have been undermined. The Commission requested these examples and the Department identified two precedents of undermined State Heritage items, notably Beulah (SHR 00368), which is a cultural landscape containing early colonial structures, and the Upper Nepean water supply system canal (SHR 01373). The Commission considers that these precedents indicate that undermining and subsidence of themselves do not necessarily compromise State heritage values and is satisfied that the appropriate approach is to consider specific risk and potential impacts to the values which support the SHR listing of the Wirrimbirra Sanctuary.

198. The Commission considers that there is minimal substantive risk to built elements within the Wirrimbirra Sanctuary and that adequate subsidence remediation measures are available as outlined in section 8.1. Recognising the role of Wirrimbirra Sanctuary in the appreciation of Australian native flora and fauna and the importance of water, the Commission notes that the Department's recommended condition C1 includes performance measures for water resources, land and biodiversity affected by the Project. For water courses in the subsidence zone, including within the Wirrimbirra Sanctuary, the relevant performance measure is - no greater subsidence impact or environmental consequences to water quality, water flows (including baseflow) or stream health (including riparian vegetation) than predicted in the Application.

199. The Commission agrees with the Department's position that potential impacts upon historic heritage items, including Wirrimbirra Sanctuary, can be appropriately managed through the imposed conditions of consent.

8.9 Visual Amenity

Applicant's Position

200. The visual impacts of the Project are addressed in section 11.17.6 of the EIS, which concludes:

> *The proposed development is not expected to create a visual impact on existing land uses within and surrounding the Project Area. Additional visual elements associated with the proposed development would be minimal and would be limited to expansion of the REA, construction of two new ventilation shafts and upgrades to the Surface Facilities Area. Further, the high Visual Absorption Capacity of the Project Area and surrounds would likely reduce the potential magnitude of the visual impact.*

201. An updated assessment of the visual impacts of the Project is provided in section 7.12.4 of the PAR, which states:

> *The amended REA would unlikely result in a level of visual effect or visual significance over and above the low impact determined in the VIA prepared for the project assessed in the EIS.*

202. The SPAR specifies that the reduction of the proposed REA disturbance footprint necessitates an increase in its height from 310 m to 320 m AHD. Section 6.9.11 of the SPAR addresses the visual impacts of the height increase, stating:

The visual assessment for the amended Project (Appendix I) has assessed the changes proposed to the REA. It confirms that the increase in the height of the REA would be restricted by existing landscape characteristics surrounding it and would not result in additional visual impacts over and above the low impact determined in the EIS and PAR.

Department's Position

203. The Department's Assessment Report does not include a standalone assessment of the visual impacts of the Project but notes that the above-ground infrastructure is predominantly retained from existing operations.

Commission's Findings

204. The Project involves raising the height of the REA to RL 320 m. The Commission inspected the REA as part of its site and locality inspection, including areas where revegetation had occurred and areas of ongoing emplacement. The Commission has reviewed the Applicant's visual impact analysis as submitted in Appendix I of the SPAR and noted the distance between the amended REA and view locations, the extent of existing tree cover between the existing REA and view locations, and the visual consistency of the proposed REA with the gently undulating landscape. The Commission considers that the proposed REA will not cause unacceptable visual impacts.

205. The Commission notes that the relocation of ventilation shaft TSC2, as discussed in section 8.4 of this Statement of Reasons, will reduce the visual impacts of the Project by consolidating surface infrastructure and reducing clearing of established native vegetation.

206. The Commission notes that most of the existing surface infrastructure will remain in use for the duration of the Project and the visual impact of this infrastructure will be prolonged as a result of the Project. The Commission considers that the visual impacts of surface infrastructure are adequately addressed by the Department's recommended condition B46 (visual amenity and lighting) which requires the Applicant to minimise the visual impacts of the development, shield views of mining operations from public roads and private residences and minimise light spill from the mine.

207. Subject to the imposed conditions, the Commission considers that the predicted visual impacts of the Project are acceptable.

8.10 Traffic

Applicant's Position

208. Traffic impacts are addressed in section 11.13 of the EIS, which concludes:

Anticipated traffic volumes for the construction and operation of the proposed development were identified and show that the operational phase will result in a greater increase in traffic (when employment is at its peak) than the construction phase. While an increase in construction and operational traffic is anticipated as a result of the proposed development, given the capacity of the existing road network this increase is considered minor.

The upgrade of the mine access intersection with Remembrance Driveway in accordance with Austroads standards is expected to improve road safety at this intersection. SIDRA traffic modelling undertaken for the intersection indicates that it will have a satisfactory to good operation in terms of vehicle delay when the proposed development reaches its peak employment (and therefore its peak traffic generation).

The potential impacts of the proposed development would be managed through the implementation of Construction Traffic Management Plans which will be prepared in consultation with both RMS and Wollondilly Shire Council.

209. Amendments relating to transport impacts are addressed in section 3.2.7 of the PAR, which states:

The Amended Project would also transport and receive the following by road transport:

- *Product coal to domestic end users where rail transport is unavailable;*
- *Imported coal to blend with Tahmoor Coal for special blends to meet specific customer requirements; and*
- *Reject material to potential domestic users where rail transport is unavailable and a market opportunity for beneficial use of rejects exists or is being investigated.*

Transport of product coal rejects from the Tahmoor Mine and importation of coal would be restricted to a maximum of 0.2 Mt per annum and a maximum of 3,000 tonnes per day. Road transport would be generally on a campaign basis and during these transport campaign periods generate a maximum of eight truck movements per hour during the period between 6 am to 7 pm. This remains consistent with the EIS.

210. Amendments relating to traffic impacts are addressed in section 3.3.6 of the PAR, which states:

The existing intersection at the entry to Tahmoor Mine from Remembrance Driveway would be upgraded as part of the Amended Project. The upgrade would provide a dedicated right-hand turning bay for vehicles entering the surface facilities area from the south; and extended acceleration and deceleration lanes for vehicles entering and exiting from the north and south.

Department's Position

211. Traffic and transport impacts of the Project are assessed in detail in section 6.7 of the Department's Assessment Report, which concludes:

Tahmoor Coal has committed to managing the Project's traffic impacts through a Traffic Management Plan, that includes measures to minimise impacts on the local road network and a Driver's Code of Conduct. The Department has recommended a condition to this effect.

Additionally, the Department has recommended a range of transport conditions to ensure the appropriate management of traffic and road safety over the life of the project, including:

- *the completion of upgrade works to the Mine Access Road and Remembrance Driveway intersection prior to the commencement of second workings;*
- *pre and post dilapidation surveys of the affected road network;*
- *daily, hourly and tonnage restrictions on heavy vehicle haulage of coal and reject material;*
- *periodic assessment of the performance of the Avon Dam Road and Remembrance Driveway intersection; and*
- *detail of measures to minimise traffic disruption during school drop off / pick-up and peak traffic periods.*

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

Commission's Findings

212. The Commission notes that the Department's recommended condition A10 includes a limit of 16 truck movements per hour and 158 truck movements per day. Noting that the SPAR refers to eight truck movements as including eight inbound and eight outbound movements, the Commission has imposed an amended version of the recommended condition to clarify that the limits shown in the condition are totals that include inbound and outbound movements.

213. The Commission considers that the availability of existing railway infrastructure for the transport of product coal from the mine is a key benefit of the Project from an efficiency, road safety, and amenity perspective.

214. The Commission agrees with the Department's finding that, subject to the Department's recommended Conditions of consent, as imposed in amended form, the Project's predicted traffic impacts are acceptable.

8.11 Human Health

Public Submissions

215. The Commission heard from Dr Kathleen Wild of Doctors for the Environment Australia at the public hearing. Dr Wild noted the significant GHG emissions predicted to be emitted by the Project and the resulting contribution to global warming and set out the evidenced connection between climate change and adverse human health impacts.

216. As discussed in section 8.5 of this Statement of Reasons, the Commission received a submission from a former student of the Wollondilly Anglican College stating that coal dust was regularly observed at the school and that students were unaware of the potential health impacts at the time.

Applicant's Position

217. A Health Impact Assessment was included in the PAR in response to a request by NSW Health. The assessment identified no significant health risks for the off-site community, including from coal dust. The assessment did not directly address the broader impacts of climate change caused by GHG emissions on human health.

Department's Position

218. Human health impacts of the Project are assessed in Table 24 of the Department's Assessment Report, which states:

Based on the HIA, NSW Health accepted the potential for adverse health impacts within the off-site community as a result of the Project are low to negligible. NSW Health emphasised the importance of ongoing community consultation with the local community.

…..

In addition, the Department has recommended conditions requiring Tahmoor Coal to keep the local community informed about the progress and specific aspects of the Project; record, handle and respond to all complaints; and establish and operate a Community Consultative Committee.

Commission's Findings

219. As discussed in section 8.5 of this Statement of Reasons, the Commission has imposed an amended version of the Department's recommended condition B11 relating to air quality to include criteria for non-residential receivers, for the purpose of avoiding adverse health impacts.

220. Health impacts of the Project are also addressed in part through the imposed conditions of consent designed to safeguard water quality and minimise noise impacts.

221. The Commission has considered the Project's contribution to climate change and the associated health impacts arising from GHG emissions as outlined in section 8.15 of this Statement of Reasons.

222. Noting that NSW Health has not raised any significant concerns regarding the human health impacts of the Project, and subject to the imposed conditions of consent, the Commission finds that the predicted human health impacts of the Project are acceptable.

8.12 Social Impacts

Applicant's Position

223. Social impacts are addressed in section 11.6.2 of the EIS, which concludes:

> *The proposed development would allow for the continued use of existing infrastructure, providing benefits by way of continuation of employment for the existing established workforce for a further 13 years. This would provide ongoing employment for the existing 390 employees as well as generate an additional 50 to 175 jobs at peak employment. The proposed development would generate significant economic benefits, including royalties and net income to the Wollondilly region and State, and would allow for community contributions for a further 13 years.*

224. The social impacts of the Project are addressed in section 6.11.2 of the SPAR, which states:

> *Of all the social aspects considered, impacts in only one aspect has increased. This is the social benefits derived from the economic impacts of the Project which is due to the removal of LW107B and LW108B from the mine plan which results in a net reduction in coal volume mined by the Project. However, the reduction in the predicted level of social impacts of the Project is also directly related to the removal of these longwalls and the resultant improvement in subsidence and subsidence-related impacts.*
>
> *As documented in the EIS and PAR, residual social impacts from the Project can be managed by Tahmoor Coal through the implementation of mitigation measures which have been informed by over 40 years of mining in the Southern Coalfields and through significant experience gained in managing social impacts in consultation with the community and other stakeholders.*

Department's Position

225. The social impacts of the Project are assessed in Table 24 of the Department's Assessment Report. The Department notes that their recommended conditions require the Applicant to prepare a Social Impact Management Plan and to establish a Community Consultative Committee in accordance with the Department's *Community Consultative Committee Guidelines: State Significant Projects (2019)*. The Department makes the following conclusions regarding social impacts of the Project:

The Department considers that with the implementation of the mitigation measures proposed for the various environmental impacts, the extent of actual and perceived social impacts could be appropriately managed.

Overall, the Department considers that with these measures in place the Project would not significantly impact the local community.

Commission's Findings

226. The Commission acknowledges the predicted social benefits of the Project associated with job creation and retention and flow-on effects to local businesses.

227. The Department's recommended condition A24 (community consultative committee) requires formation of a Community Consultative Committee for the Project within six months of the development commencing. The Department's recommended condition A25 allows for the committee to be merged with the existing consultative committee for the mine with the approval of the Planning Secretary. The Commission considers that it is necessary to ensure continuity for all stakeholders and has accordingly imposed an amended version of the recommended condition A24 to specify a minimum meeting frequency of once every six months, consistent with the existing committee, and to require that the new committee (even if merged with the existing consultative committee for the mine) must be established within three months of commencement of development under the Application.

228. The Commission considers that the predicted subsidence impacts of the Project present a risk of significant social impacts for those affected. In particular, the Commission is mindful of the potential fear and anxiety of those whose residences of businesses are located within the area that may be affected by subsidence and that, for some of those affected, this issue may continue for a number of years. Mitigating such social impacts in an appropriate manner depends in large part on effective and timely restitution for subsidence impacted households as discussed in section 8.1 of this Statement of Reasons. However, the Commission also considers that it is necessary for the Applicant to provide appropriate, regular and proactive communication to those at risk of subsidence in order to best manage social impacts. The Commission is satisfied that such communication can be appropriately managed through the imposition of condition B69 (Social Impact Management Plan).

229. Subject to the imposed conditions of consent, the Commission finds that the predicted social impacts of the Project are acceptable.

8.13 Economics

Public Submissions

230. The economic benefits of the project were raised in presentations at the public hearing and written submissions to the Commission. Bottom-up analysis (section 4.2) indicates that approximately 70% of unique author submissions focussed on economic impacts, and of these, 96% were in support of the project.

231. Comments to the Commission in support of the project emphasised the following benefits:

- the employment created by the project;
- the contribution to local, regional and national economies;
- the tax revenue generated by the mine, and;
- the flow on benefits to local businesses.

232. Comments in objection to the project raised the following matters

- the validity of economic modelling, and in particular the basis for calculating the project's value and the cost benefit analysis;
- questions regarding the financial viability of the mine;
- potentially inadequate funding for remediation or subsidence restitution;
- projections for falling coal demand and the implications for project viability; and
- overstated local employment.

233. Multiple submissions noted that minutes of the Tahmoor Colliery Consultative Committee from September 2019 identified that the mine was running at a loss, with a Tahmoor Coal Representative stating:

> *Coking Coal price continues to be challenged by Covid-19 related global effects. Tahmoor Coal is running at a loss. A plan is being put in place to ensure recovery from this.*

The Australia Institute

234. The Commission heard from the Australia Institute, including a presentation at the public hearing and submission of a detailed written report concerning the economic assessment supporting the Application and the economic merits of the Project. The written report includes the following summary of the Australia Institute's position:

> *The economic case for the Tahmoor project has been heavily overstated by its consultants and the Department of Planning, Industry and Environment. Methods relied on have been described in the NSW Land and Environment Court as "inflated", "incorrect" and "plainly wrong".*

235. The Australia Institute presentation and submission stated that the Department's Assessment Report did not properly address the issues raised in the Oxford Economics review of the Applicant's economic analysis. The Australia Institute drew particular attention to the inclusion of worker and supplier benefits in the Applicant's cost benefit analysis, stating:

> *In our view, it is extraordinary that Mr Brown* [Ernst and Young] *continues to use the same methodology to inflate the value of coal mines despite such strong criticism from the Chief Judge of the Land and Environment Court and the expert witness called by the DPIE. The fact that the DPIE still accepts assessments that include these calculations and quotes figures that include this value is difficult to understand.*

236. The Australia Institute's submission makes the following recommendations:

> *In our view, the economic value of the project has certainly been overstated and is likely to be negative when environmental impacts and its probably-precarious position in the coal market are considered. It should therefore be rejected.*
>
> *Whatever the IPC's final decision, we urge commissioners to make a strong statement on economic assessment particularly on the inflated values of worker and supplier benefits. It is worth noting that Deloitte Access Economics, and most other consultants, do not include these values….*

Applicant's Position

237. An economic analysis by Cadence Economics was included as Appendix R of the EIS, and was discussed in section 11.16.6 of the EIS, which stated:

The overall finding of the CBA is that the proposed development as a whole is likely to deliver net economic benefits. In the central case (which is based on a 7% discount rate) the proposed development delivers net benefits of around $699.5 million over its life, of which up to $132.0 million would flow through to the local Wollondilly region (in NPV terms).

238. An economic analysis by Ernst and Young was included as Appendix L of the PAR and discussed in section 7.11.3 of the PAR, which stated:

The revised Economic Impact Assessment demonstrates that the Amended Project would generate significant economic benefits to the local and State economy, with a net benefit of $783.8 million.

239. A revised economic analysis by Ernst and Young, addressing project amendments was included as Appendix K of the SPAR and discussed in section 6.12 of the SPAR, which stated:

The net benefit of the Project is estimated to be $664.9 million in NPV. This is comprised of $215.0 million and $450.0 million in direct and indirect benefits respectively..... This represents a decrease in economic benefit when compared to the CBA undertaken in the EIS and PAR which was $699.5 million and $783.8 million in NPV terms, respectively.

240. The Applicant's submission to the Commission, following the public hearing and closure of the submissions period, included a response from Ernst and Young, addressing comments in the public hearing regarding worker benefits, supplier benefits and uncertainties relating to coal markets, and stating:

Tahmoor Coal Pty Ltd engaged EY to undertake an independent economic impact assessment of the proposed Tahmoor South Coal Project ("the Report") in accordance with the Guidelines for the economic assessment of mining and coal seam gas proposals, as published by the NSW government in December 2015 ("the Guidelines") and the Technical Notes supporting the Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals (the Technical Notes) published in April 2018.

.....

The analysis presented in the economic impact assessment of the Tahmoor South Coal Project follows a logical framework in accordance with The Guidelines, and further confirms this through the CGE modelling assessment.

Department's Position

241. As part of its assessment the Department engaged BIS Oxford Economics to undertake a peer review of the Ernst and Young assessment submitted with the PAR.

242. Regarding the Ernst and Young cost benefit analysis, the Oxford Economics review raised issues with assumptions and methodologies associated with:

- production volumes and pricing assumptions;
- producer surplus;
- sensitivity tests;
- benefits to workers;
- benefits to suppliers;
- distributional impacts, and;
- environmental and social externalities.

243. Regarding benefits to workers, the Oxford Economics review stated:

This review finds that much of the CBA is well-researched and (with some exceptions) well presented. Much of the approach is reasonable. Attention has been paid, in many (though not all) cases, to the stipulations laid down in the NSW Government (2015) Guidelines for the economic assessment of mining and coal seam gas proposals ("the Guidelines").

That said, there remain a number of areas of concern with the CBA. These include the following:

…..

Benefits to workers – The discussion and calculations in this section are not consistent with key elements of the Guidelines which call for strong evidence to be presented in support of wage premiums and consequent worker benefits. We suggest that benefits to workers be omitted from the CBA. As such benefits amount to $264.3 million in NPV terms, this would have material impacts on the assessed benefits to NSW (reducing benefits by approximately one third). This would not in itself make the project unviable but if combined with higher externalities, contingencies and/or other costs could make it more marginal.

244. The Oxford Economics review made the following conclusion regarding the Ernst and Young cost benefit analysis:

The project remains viable ($519.5 million net benefits, NPV terms) even with the omission of material items such as benefits to workers. If greenhouse gas emissions were also assessed at the global level then net benefits fall to $417.2 million in NPV terms. Nonetheless, viability may be reduced if other issues arise (e.g. contingencies, other/higher environmental costs). The EIA should be revised with benefits to workers omitted (at the very least). The Department may also wish to undertake further investigations into the highlighted issues.

245. The Department's assessment of the Project's economic impacts is provided in Table 24 of the Department's Assessment Report, stating:

The Department accepts that the Project would generate a significant number of direct and indirect jobs, and that a significant percentage of the workers would reside in the local and regional area. Further, the Department expects that a large proportion of workers' salaries would be reinvested and circulated within the region.

- *However, the Department also agrees with findings from Oxford that the calculation of worker benefits should be excluded from the CBA as it is highly likely that the Project's workforce would comprise workers from the mining sector, including those employees currently working at the mine.*
- *The Department recognises that there is inherent uncertainty in estimating costs and benefits over the life of a mine. However, when considering conservative assumptions, including a zero worker benefits and the global proportion of greenhouse gas emission costs[4], the Department considers that the project would still result in significant economic benefits to local and regional areas, and to the State of NSW. As such, the Department considers the project justified from an economic efficiency perspective.*

246. The Commission questioned the Department further during the Department's closing presentation at the public hearing, particularly concerning worker benefits calculations, costing of externalities, and sensitivities to changes to the price of coal. The Department stated:

….if one assumes a zero worker benefit and takes off, you know, $270 million and a proportion also for greenhouse gas emission costs, you're still in a very substantial net positive NPV for New South Wales, even taking those factors into consideration.

…..

The other thing I would say is in terms of the economic efficiency and the application of the guidelines, and my understanding is that certain sensitivities were included in that NPV estimation around coking coal demand and particularly in regard to prices within the market, and that even within that sensitivity analysis, it was still found to be a significantly positive economic proposition to proceed with the project. But, clearly, at the end of the day ….. I would say that, well, if the demand is not there and the price is not right, then the project won't be developed.

Commission's Findings

247. The Department acknowledges that the coal price assumptions in the Ernst and Young assessment of the SPAR (average of $181.5 dollars per tonne for coking coal) may not reflect fluctuations or trends in coal prices since the report was prepared and throughout the life of the Project. However, the Ernst and Young sensitivity analysis did factor in a 25% reduction in coal prices over the lifetime of the Project as a lower assumption.

248. The Ernst and Young report on the SPAR calculates the GHG cost as $102.6 million in NPV terms, based on an assumed abatement price of $16.14 tCO2-e and Project emissions of 10.4 million tonnes CO2-e of Scope 1 and of Scope 2 GHG, noting that Ernst and Young applied a 7% discount rate to the NPV for GHG emissions.

249. The Commission notes the Department's agreement with the Oxford Economics finding that the calculation of worker benefits should be excluded from the cost benefit analysis. It is also noted that the Oxford Economics review preceded the SPAR, and that an independent expert review of the SPAR was not undertaken.

250. The Commission has considered submissions regarding records of the Tahmoor Colliery Consultative Committee identifying that the mine was operating at a loss as of September 2019. The Commission notes that, whilst highlighting the degree of uncertainty in predicting economic performance, this information does not prevent the Commission from relying on the economic assessment presented in the Applicant's submission and the Oxford Economics review.

251. The Oxford Economics review of the PAR finds that the NPV is likely to be more marginal and sensitive to externalities than is indicated by the Ernst and Young assessment in the PAR, but finds that the Project would remain viable even with the omission of material items such as benefits to workers and with GHG emissions assessed at a global level.

252. The Commission acknowledges the lack of consensus on the Project's NPV and the significant discrepancies in preferred methodology between the Applicant's consultants and Oxford Economics. However, even allowing for the downside of the reported sensitivities, the Commission is satisfied that the Project is likely to generate a positive NPV.

8.14 Mine Closure and Rehabilitation

Applicant's Position

253. Mine closure and rehabilitation are addressed in section 11.23.5 of the EIS, which states:

The general rehabilitation measures to be implemented following the removal of infrastructure within closure domains include rehabilitation of the REA, rehabilitation of subsidence impacts, topsoil management, erosion and sediment control, revegetation and monitoring and maintenance requirements.

It is anticipated that detailed mine closure planning would be undertaken at least five years from closure, and would build upon the concept outlined in this EIS.

254. Updates to the mine closure and rehabilitation plan are discussed in section 6.10.4 of the SPAR, which states:

The amended REA reduces potential impacts that resulted from the additional topsoil stripping of the previously proposed REA expansion and contains all disturbance to the existing approved REA area. As a result, the existing REA will be required to be an additional 10m above the previously specified top landform height.

Department's Position

255. Mine closure and rehabilitation are assessed in Table 24 of the Department's Assessment Report, which finds:

The Department accepts that detailed information on rehabilitation strategies can be prepared post-determination. The Department has recommended that Tahmoor Coal prepare a comprehensive Rehabilitation Strategy in consultation with the RR, DPIE Water, BCS and WSC within 6 months of the commencement of the Project.

…..

In addition, the Department has recommended that a Rehabilitation Management Plan be prepared for the Project, in accordance with the conditions imposed on the mining lease(s) associated with the development under the Mining Act 1992.

Commission's Findings

256. The Commission agrees with the Department's finding that that mine closure and rehabilitation can be adequately addressed through the Department's recommended conditions of consent as imposed by the Commission.

8.15 Greenhouse Gases

Public Comments

257. The predicted GHG intensity of the Project was raised by multiple presenters at the public hearing and in written submissions to the Commission. The Environmental Defenders Office (**EDO**), acting on behalf of Undermined Inc, presented at the public hearing and also briefed Professor Penny Sackett and Professor James Goodman.

258. Mr Matt Floro of the Environmental Defenders Office presented at the Public Hearing and set out the statutory context for the consideration of Scope 1, 2 and 3 GHG emissions of SSD applications. Mr Floro argued that the GHG intensity of the project meant it should be refused, stating:

The environmental impacts of the Project are sufficiently adverse in both absolute and relative terms to warrant refusal.

259. The Environmental Defenders Office submitted a detailed report to the Commission covering the role of the Commission, the relevant matters to be considered by the Commission, the likely environmental impacts of the development, and statutory pathways to refusal. Regarding GHG offsetting, the EDO submission stated:

> *Undermined opposes the granting of consent to the Project. If, however, the IPC were minded to grant consent to the Project, Undermined submits that it would be irrational and unreasonable for the IPC to grant consent and not ensure that the Project's total Scope 1, 2 and 3 emissions are required to be offset such that the Project is carbon neutral.*

260. Professor Penny Sackett of the ANU Climate Change Institute, presenting at the public hearing, outlined current climate change projections and argued that the predicted GHG emissions of the mine would constitute a significant increase, relative to the necessary decrease in the State's emissions to meet adopted targets.

261. Professor James Goodman of the University of Technology Sydney presented at the Public Hearing and submitted a report in relation to the GHG emissions and climate change impacts of the Project, stating:

> *I suggest that the assessment submitted by the applicant and endorsed by the Department of Planning, Industry and Environment (DPIE) fails to take into account critical impacts of the project. If it were to do so, using its own metric for calculating for per-unit cost of emissions, in my opinion the Project would have to be reassessed as producing a net dis-benefit of more than $600m. The financial impact cost of abating the Scope 1 and 2 emissions alone is $378m.*

262. Other issues related to GHG emissions of the Project raised in public submissions included:

- the Department's Assessment Report does not properly address the impacts of climate change on the NSW environment and its people;
- the Department's Assessment Report does not properly address the Project's emissions in relation to adopted reduction targets;
- decision makers have a responsibility to protect citizens from the impacts of climate change;
- the benefits of GHG offsets are uncertain.

263. The Commission opened submissions for a second time (section 4.2) to invite comments on letters from the Applicant, dated 9 April 2021, and the Department, dated 12 April 2021, regarding the GHG emissions of the Project. Additional issues raised included:

- measurement and reporting of GHG emissions should be undertaken by an independent body
- the Applicant's claim that VAM abatement is not financially viable is unsubstantiated
- the efficacy and reliability of offsetting GHG emissions is uncertain

264. The Australia Institute responded to the Applicant's assertion that VAM abatement technologies (at a price of $100+ million) could not be feasibly implemented at this time, stating:

> *This statement is contradicted by the applicant's economic assessment, which claims "the Project is estimated to generate a pre-tax profit of $490.0 million in NPV terms." – The Australia Institute*

265. Undermined Inc also commented on VAM abatement, stating:

The cost of purchasing Australian Carbon Credit Units (ACCUs) to offset equivalent emissions at $15.74 or more would be $294M. If it is 'reasonable and feasible 'for Australian taxpayers to buy abatement at a cost of $15.74 or more per tonne, it is surely 'reasonable and feasible 'for SIMEC to pay a third (or less) of this cost to abate their VAM emissions ($5.35 per tonne).

266. Holding Redlich, acting on behalf of Ironlaw Pty Ltd, commented on the specificity of the Applicant's suggested conditions of consent on GHG abatement, stating:

The development consent conditions proposed by the Proponent lack specificity, certainty and finality. They are vague in what the Proponent is actually required to do, and do not set any particular reduction requirements. Furthermore and of concern, they do not resolve the concerns that the IPC has raised with this aspect of the Project. If the proposed conditions were imposed by the IPC, the consent may be open to a finding of invalidity on this basis.

Applicant's Position

267. Predicted GHG emissions have been successively updated in response to project amendments, and are reported in the following documents:

- EIS Appendix O – Greenhouse Gas Assessment
- PAR Appendix K – Greenhouse Gas Assessment
- SPAR Appendix H – Air Quality and Greenhouse Gas

268. The projected GHG emissions presented in the SPAR are:

- Scope 1 - 9,397,498 t CO2-e
- Scope 2 - 1,001,338 t CO2-e
- Scope 3 - 65,832,595 t CO2-e

269. The above figures represent the Applicant's "abated scenario" which includes using captured methane for electricity generation and, where possible, flaring of captured methane.

270. The Department's Request for Information No. 2 sought the predicted worst-case scenario figures for Scope 1 and Scope 2 GHG emissions. The Applicant's response (RRFI2) reported worst-case-scenario GHG emissions which significantly exceeded the figures reported in the EIS, PAR and SPAR. The response stated:

In responding to this request, the Scope 1, 2 and 3 emission predictions for the Project have been updated based on the latest relevant data available. The intensity factors used to relate tonnes of ROM to tonnes of CO2-e in the EIS and subsequent amendments were based on NGER reporting numbers from 2010-2013 (from when work commenced on the EIS) and have now been updated to incorporate the most recent figures from 2018-2020. 31 Table 6 over the page presents a summary of the revised predicted Scope 1, 2 and 3 emissions for the Project including the use of flaring and power generation, and Table 7 presents unabated emission predictions (i.e. without flaring and power generation).

271. The Applicant's Response to RFI No.3 reiterated the reason for the emissions predictions given in the Response to RFI No. 2 and why this figure was substantially higher than the EIS, PAR and SPAR figures. RRFI No. 3 stated:

Previous greenhouse gas assessments for the Tahmoor South Project (i.e. for the EIS, First Amendment Report and Second Amendment Report) were based on estimated CO2-e values. When updating the predicted Scope 1 emissions for the response to RFI Number 2, it became apparent that the CO2-e values used were low compared with more recent NGER data. ERM went back to first principles and applied the methane global warming potential value to the recent reported methane emissions from Tahmoor Mine. The intensity factor methodology was then used to calculate CO2-e emissions for the Project. An intensity factor, in this context, relates the total ROM coal mined in the year to the CO2-e released in that same year to find the ratio between these two values. This factor is then applied to estimated annual ROM coal production for the life of the Project. In this case, intensity factors were calculated for 2018, 2019 and 2020 and the average of these was applied going forward from 2021 to 2032.

272. The Applicant's written submission to the Commission, dated 21 February 2021, responded to the Commission's questions on the Project's GHG emissions raised in the meeting with the Applicant. The written response stated:

Tahmoor Mine has been actively capturing and abating its fugitive methane emissions through flaring and power generation for many years and remains committed to continuing this abatement throughout the life of the Project. The flare plant was installed at Tahmoor mine in 2012 with three Hofstetter Flares. The power generation plant is owned and operated by Energy Developments Limited (EDL). It has seven Jenbacher Gas Engines / 1 MW generators and has been operating onsite, reducing Scope 1 GHG emissions, for approximately 20 years.

As much as practically possible of the methane extracted via the gas drainage operations (around 99 per cent) is either used to generate power onsite or flared, significantly reducing Scope 1 GHG emissions. Therefore, only one of the fugitive methane emission source streams, methane in the ventilation air, is vented to the atmosphere. Given the extremely low concentration of methane in this stream, which is approximately 0.3 to 0.4 per cent, the methane gas is not able to be captured and used in a beneficial manner.

273. The Applicant's written submission to the Commission, *inter alia*, suggested the following additional commitments regarding GHG emissions:

a) To support the CN30 program, and to support the objectives of the NSW Climate Change Policy Framework, Tahmoor Coal will continue to investigate opportunities for the reduction of Scope 1 and Scope 2 emissions from this Project as part of any Energy Savings Action Plan (or 'Air Quality and Greenhouse Gas Management Plan'). Tahmoor Coal is willing to make specific reference to carbon neutrality commitments in any standalone Statement of Commitments.

…..

c) With the objective of going some way to offsetting Scope 3 GHG emissions, Tahmoor Coal is willing to accept a Recommended Condition relating to the investigation of carbon sink options, as described in 4.6.1.

274. The Commission wrote to the Department on 31 March 2021 setting out the Commission's concerns regarding the GHG intensity of the Project and asking the Department to consult with the Applicant and respond to the following questions:

1. Whether there are further abatement measures that the Applicant could take to further reduce the predicted Scope 1 GHGE of the Project below 19,310,249 t CO_2-e.

2. If the Panel was minded to grant development consent to the Project subject to conditions that:

a. impose a target for Scope 1 GHGE less than that presently estimated by the Applicant; and

b. having the Applicant implement measures to address actual Scope 1 GHGE of the Project in excess of that target (including the possibility of offsets),

at what amount of Scope 1 GHGE does the Applicant consider that target could feasibly and reasonably be set?

275. The Applicant provided a written response to the Department, dated 9 April 2021 which responded to the Commission's questions. The Department forwarded the Applicant's response to the Commission along with a letter prepared by the Department, dated 12 April 2021. The Applicant's letter:

- acknowledged that Tahmoor mine is a relatively gassy mine;
- set out policy considerations relevant to the Project's GHG emissions and argued that current policy does not place a limit on Scope 1 GHG emissions from any particular mine;
- noted that previous data comparing the Project's GHG emissions with other coal mines was derived from a 1999 report and required updating;
- provided an updated comparison of the Project's Scope 1 GHG emissions with a selection of other coal mines;
- discussed options for abatement measures, including a ventilation air methane (VAM) plant, in-seam gas drainage, surface to in-seam gas drainage, and sealing of areas of the mine (although no new measures were proposed);
- stated that Tahmoor Coal considers that it would be inappropriate to propose further GHGE reduction targets for the Project.
- outlined a range of possible additional conditions of consent relating to ongoing monitoring of the Project's GHG emissions and further investigation of available abatement measures within two years of development consent being granted, and thereafter.

Department's Position

276. The Department's Assessment Report addresses GHG emissions within Table 24 (Other Issues) and Appendix H (consideration of EPIs). Table 24 of the Department's Assessment Report states:

Tahmoor Coal has advised that the concentration of methane within captured gas is not always suitable for beneficial reuse and therefore flaring and power generation is subject to variability. Additionally, gas management infrastructure on the site is operated by a third party and is therefore subject to commercial contractual considerations.

….

The Department considers that the key areas for active management of GHGEs within the development assessment and approval process for new projects in NSW are reductions in direct emissions and improved energy efficiency (ie Scope 1 and 2 emissions).

….

In terms of Scope 1 and Scope 2 emissions, the Department considers that the Project's direct GHGEs and bought-in electricity use would make a very small contribution towards anthropogenic climate change at the State, national or global scale.

….

The Department has recommended conditions requiring the Applicant to implement all reasonable and feasible measures to maximise the beneficial re-use of methane on site and that all mitigation measures are detailed in an Air Quality and Greenhouse Gas Management Plan.

277. Appendix H of the Department's Assessment Report includes consideration of the Mining SEPP as it relates to GHG emissions, stating:

It is important to note that the established national and state policy frameworks do not seek to restrict private development in order to meet Australia's commitments under the Paris Agreement. Nor do these frameworks impose any prescriptive emissions criteria which can be applied in development assessments.

Further, it is important to note that there is no current practical alternative to the use of coking coal for the large scale, economic production of virgin iron and steel. While progress is being made in regard to the development of 'green steel' technology based on using hydrogen as a fuel, the Department is not aware of any steelmaking in Australia or overseas able to produce steel in commercial quantities without relying on coking coal. It is likely to be many years before this technology is adopted at a scale that would significantly reduce global demand for coking coal.

This view is supported by the NSW Government's Strategic Statement on Coal Exploration and Mining in NSW (2020), which identified that in the medium term there will still be a strong global demand for coking coal for steel making.

In terms of Scope 1 and Scope 2 emissions, the Department considers that the Project's direct GHGEs and bought-in electricity would make a very small contribution towards anthropogenic climate change at either the State, national or global scales. The Project contains proposals by which its direct GHGEs from drained mine gas may be substantially mitigated through flaring, which through combustion turns methane into CO_2, with its substantially reduced greenhouse intensity.

278. The Department's letter to the Commission, dated 12 April 2021, which enclosed the Applicant's letter of 9 April 2021, provided further commentary on the GHG emissions of the Project. The Department's letter restated the policy context for the assessment of GHG emissions, and also made the following observations:

- *Due to being a gassy mine, Ventilation Air Methane (VAM) is by far the main contributor to Scope 1 emissions, being 18.7 Mt $C0_2$-e of a total 19.3 Mt $C0_2$-e (around 97 per cent).*
- *Under current technology, with high ventilation air flow and low methane concentrations (0.3-0.4 per cent) there is limited opportunity to cost effectively capture and oxidise methane to carbon dioxide to further reduce Scope 1 emissions.*
- *Commercial systems to treat VAM are available but are currently high cost. SIMEC estimated that it would cost around $100 million to develop and operate a VAM treatment system which, SIMEC argues, given the significant amendments to the project already, would make the project financially unviable and would increase Scope 2 emissions.*

- *However, VAM treatment technology is still in development and SIMEC has committed to ongoing review of the technology over the life of the project.*
- *There is limited opportunity to increase pre-drainage and post drainage methane capture ahead of mining through either in-seam or surface to seam methods.*

Environment Protection Authority's Position

279. In its meeting with the Commission, the EPA provided the following statement regarding the regulation of GHG emissions:

> *Currently, we do not routinely impose greenhouse gas-related requirements on our licences, such as monitoring and reporting; however, we are encouraging our major industry sectors to help the New South Wales Government achieve net zero emissions by 2050 by proactively reducing their greenhouse gas emissions and planning for the risks of climate change. The EPA spoke with the Minerals Council in November 2020, and it's requested information from the Council about what that sector is doing to reduce emissions. And, look, while the EPA does have pre-existing policy levers it could use to directly regulate greenhouse gas, it's a significant undertaking and needs to be carefully considered as to how it fits within the New South Wales Government's climate change policy framework and does not duplicate or undermine the actions being taken by government.*
>
> *The EPA's not the lead on climate change framework, and we provide advice to the IPC on the relevant policy and science areas within DPIE. And, generally, the EPA does not assess greenhouse gas and SSD documents.*

280. The EPA also raised the example of West Cliff Colliery, which employed emerging technology for the beneficial reuse of low-concentration ventilation-air methane.

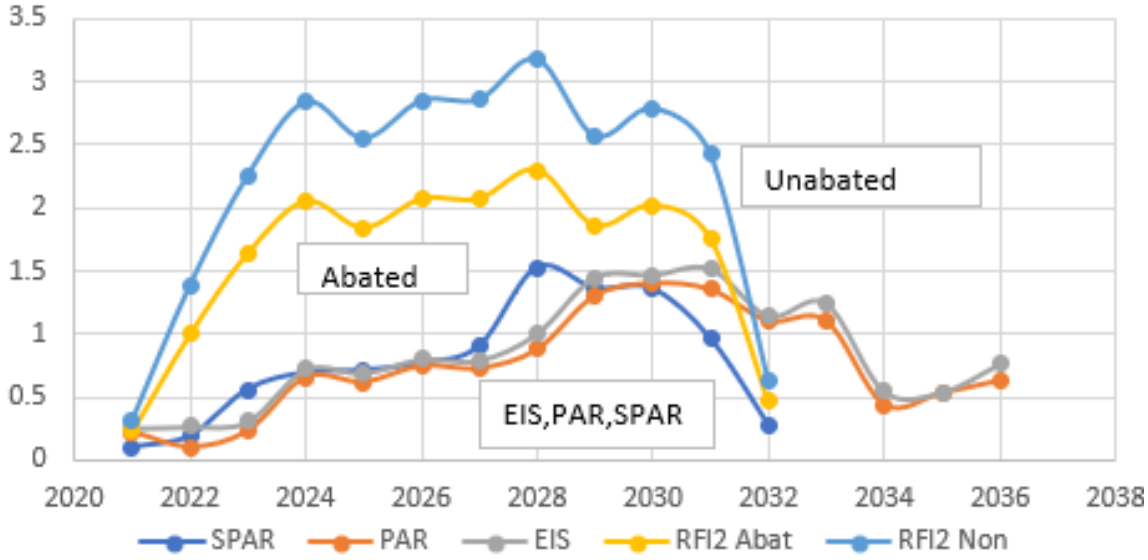
Commission's Findings

281. Various predictions for the total project life GHG emissions have been provided in the EIS, PAR, SPAR and RRFI 2 respectively. A comparison of the values is provided in Table 5 and the varying annual predictions are plotted in Figure 6.

***Table 5**: Project Whole-of-life GHG Emissions Reported (tonnes CO2-e)*

Source	EIS	PAR	SPAR	RRFI2
ROM Coal (t)	47,736,892	42,352,980	33,000,000	Approximately 33,000,000
Scope 1 (t CO2-e)	13,468,487	12,077,868	9,397,498	19,310,249 (abated) 26,686,882 (unabated)
Scope 2 (t CO2-e)	1,463,663 1	1,298,586	1,001,338	1,239,350
Scope 3 (t CO2-e)	104,552,988	88,259,920	65,832,595	65,832,595

***Figure 6**: Comparison of GHG Emissions between Application Documents (Mt CO2-e)*



282. The Commission has based its assessment of the GHG impacts of the Project on the figures provided in RRFI2, which were again put to the Commission in the Applicant's submission to the Commission following the public hearing. The annual predicted Scope 1 and 2 GHG emissions for the Project based on both flaring and power generation are shown in Table 6 below.

***Table 6**: Predicted Scope 1 and 2 Greenhouse Gas Emissions (tonnes Co2-e) (source: RRFI2)*

Year	**Scope 1 (t CO2-e)** (flaring and power generation occurring)	**Scope 2 (t CO2-e)**	**Scope 3 (t CO2-e)**
2021	230,041	14,764	525,244
2022	1,003,246	64,389	2,880,188
2023	1,636,849	105,054	4,837,896
2024	2,054,557	131,863	6,618,074
2025	1,843,089	118,291	6,467,475
2026	2,065,327	132,555	7,763,571
2027	2,070,977	132,917	7,735,856
2028	2,301,721	147,727	8,463,474
2029	1,859,357	119,335	6,939,653
2030	2,016,949	129,450	6,515,485
2031	1,761,824	113,076	5,520,472
2032	466,314	29,928	1,565,209
Total	19,310,249	1,239,350	65,832,595
Annual average	1,609,187	103,279	5,486,050

283. The Commission notes the initial submission from Professor Penny Sackett regarding the GHG emissions of the Project. It is noted that this analysis does not appear to take into account the fact that the emissions from the proposed Tahmoor South Mine would largely replace those from the Tahmoor North Mine which is scheduled to close in 2022. The Commission has based its consideration on a 'baseline' position that the Tahmoor Mine will close in 2022, if consent for the Project is not granted.

284. The existing Tahmoor Mine is subject to reporting requirements under the Australian Government's National Greenhouse and Energy Reporting (**Safeguard Mechanism**) Rule 2015. The Safeguard Mechanism applies to facilities that emit Scope 1 emissions of more than 100,000 tonnes of carbon dioxide equivalent (**CO_2-e**) per year and is administered by the Clean Energy Regulator. Reporting is against a baseline value provided by the Regulator. Information provided is made publicly available and exceedances may attract a requirement for offsets. Tahmoor Mine has provided this information independently, commencing in 2016-17. For the 2020 financial year data, the continuing baseline is 1,543,151 tonnes CO_2-e per annum and the actual Scope 1 emissions are 1,238,774 tonnes CO_2-e per annum. The baseline is due to be reset in 2021. The predicted values of Scope 1 emissions provided in RRFI2 are compatible (once allowance is made for scaling of production) with those recently reported for the existing Tahmoor Mine, noting that the Project proposes mining within the same coal seam using identical recovery methods.

285. The existing Tahmoor Mine operates in the Bulli Seam and is considered to be a gassy mine, as was acknowledged in the Applicant's letter dated 9 April 2021 and earlier in the EIS, PAR and SPAR. Based on the figures in RRFI2, the Project is predicted to emit fugitive methane equivalent to approximately 18.7 million tonnes of CO2 over the life of the Project.

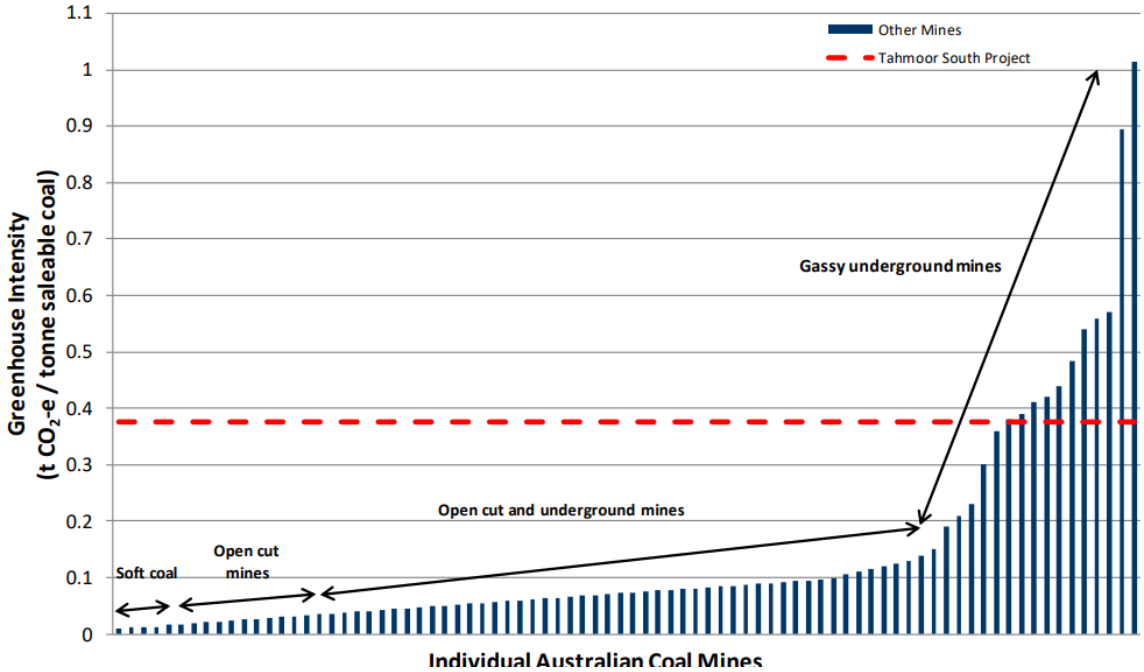
286. Figure 7 is taken from Appendix K of the PAR and shows the GHG emission intensities of a selection of Australian coal mines. The red broken line represents the Project's greenhouse intensity as reported in the PAR (0.375 tCO_2-e per tonne of saleable coal) which is similar to other gassy underground mines. It is acknowledged that the emissions data presented in Figure 7 were from a 1999 publication; however, limited checking of available data for NSW coal mines in 2019 suggests that the range of figures shown still apply.

287. The updated Scope 1 GHG emissions reported in RRFI2 are significantly higher than in the PAR and SPAR. Based on the total Project life Scope 1 GHG emissions reported in RRFI2 and production of 33 Mt ROM coal, the Commission has calculated the Project's greenhouse intensity to be in the order of:

- 0.76 tCO_2-e per tonne of saleable coal for the abated case; and
- 1.05 tCO_2-e per tonne of saleable coal for the unabated case

288. Both are amongst the highest of the Australian coal mines shown in Figure 7, below.

Figure 7: *Comparison of Scope 1 GHG Emissions of Australian Coal Mines (source: PAR Appendix K)*



289. The Commission raised the greenhouse intensity of the Project as an issue in its meeting with the Applicant and asked for clarification regarding the proposed management of fugitive methane. In response, the Applicant's written submission dated February 2021 provided figures for Project life fugitive methane emissions (Scope 1) under the abated scenario. These figures, shown in Table 7 below, represent a capture of circa 37% of the methane released by the recovery of the coal, with the greatest proportion of methane leaving untreated in mine ventilation air.

Table 7: *Scope 1 Fugitive Methane Emissions – abated (source: Applicant's Letter, February 2021)*

ROM Coal (t)	Mine Ventilation (tCO_2-e)	Pre/Post Drainage (tCO_2-e)	Flares (tCO_2-e)	Power Generation (tCO_2-e)
32,658,327	17,387,180	108,493	719,950	496,639

290. Based on these observations, the Commission raised further questions in a letter to the Department dated 31 March 2021 which requested that the Department consult with the Applicant and to respond to the Commission, to determine whether a greater proportion of the fugitive methane can be captured and either used beneficially or flared so as to reduce its GHG impact.

291. The Applicant has responded advising the Commission that no reductions beyond the Scope 1 GHG emissions figures reported in RRFI2 can reasonably and feasibly be achieved at this time. The Applicant suggested potential additional commitments, including an obligation to continue to investigate abatement options.

292. The Project benefits from existing flaring and a waste generation power plant infrastructure which is necessary for achieving the abated GHG emission values reported in RRFI2. The Commission also notes that technology available for the management of ventilation air methane may improve through the proposed life of the Project and could offer a feasible means of further abating the fugitive methane emissions of the mine.

293. Having considered the high greenhouse intensity of the mine and the Applicant's position that further abatement is not currently feasible, the Commission has imposed conditions limiting the total emissions from the Project to the abated figures reported in the RRFI2, providing measures to address any exceedance and requiring further investigation of abatement options and regular public reporting of the Project's emissions.

294. The Commission has imposed a condition requiring the Applicant to prepare an Air Quality and Greenhouse Gas Management Plan for the development to the satisfaction of the Planning Secretary, which *inter alia* describes measures to minimise the carbon dioxide equivalent of GHG emissions released from the Site. The Applicant is required to prepare the plan in consultation with the EPA, NSW Health, the Clean Energy Regulator and the CCC and to incorporate the relevant GHG emission requirements imposed by the Commission.

295. The Commission has also imposed an additional condition requiring the Applicant to ensure that all reasonable and feasible avoidance and mitigation measures are employed so that GHG emissions generated by the development are minimised. Additional requirements include:

- preparing a study two years after consent is granted and every three years thereafter which determines whether there are any reasonable and feasible measures that can be implemented to further reduce the abated Scope 1 and 2 GHG emissions;
- implementing any reasonable and feasible measures identified by the study in a timeframe agreed with the Planning Secretary;
- ensuring that the development does not exceed the Scope 1 and 2 GHG emissions as shown in Table 6 with years from project commencement substituting for calendar years;
- monitoring and reporting actual GHG emissions, (including both annual figures and three-year rolling average), an annual basis both publicly and to the Planning Secretary;
- ensuring that any exceedances of the forecast Scope 1 and 2 GHG emissions (based on a three-year rolling average) are offset by a mechanism to address the exceedances to the satisfaction of the Planning Secretary (on the basis that this mechanism may take into account any exceedances already offset under other applicable Commonwealth or State requirements); and
- ensuring that appropriate annual returns are made under the National Greenhouse and Energy Reporting legislation.

296. The conditions imposed are considered suitable to ensure that all reasonable and feasible efforts are made to reduce the Scope 1 and 2 GHG emissions of the Project, and to ensure the actual impacts of the Project are publicly reported.

297. The Commission notes that Scope 3 emissions, which are overwhelmingly caused by the use of coking coal for the manufacture of steel, account for more than 70% of the total GHG emissions of the Project. The Commission acknowledges that there is limited scope for the Applicant to directly reduce Scope 3 emissions.

298. Although it is acknowledged that the relative GHG emission intensity of the mine is high, the Commission considers that in absolute terms the projected total project life GHG emissions are reasonable.

299. In assessing the acceptability of the Project's GHG emissions, the Commission has weighed the impacts of the greenhouse intensity and the total projected GHG emissions of the Project against its benefits, including the use of existing surface infrastructure, the availability of a rail connection, and its economic benefits. Subject to the conditions of consent imposed, including a requirement for ongoing investigation and implementation of measures to reduce GHG emissions, the Commission has found that the GHG emissions of the Project are acceptable, given the financial burden that immediate implementation of new technology would have on the continued operation of an existing mine.

9 EVALUATION

9.1 Likely Impacts of the Project

300. The Commission has assessed the likely environmental, social and economic impacts of the Project, having considered the Application, written submissions, presentations at the public hearing, the Department's whole of government assessment in its Assessment Report, and all other material at section 4 of this Statement of Reasons.

301. The Commission considers that the Applicant's assessment of potential impacts of the development benefits from incorporation of prior learnings from its operation of the mine and is generally well evidenced.

302. Although the magnitude of the economic benefit of the Project (section 8.13) may be smaller than that presented by the Applicant and the Department's Assessment Report, the Commission agrees that the Project is predicted to generate a positive NPV.

303. The Commission has considered evidence relating to the potential impacts of mine subsidence and has imposed conditions which avoid, reduce and/or compensate for the potential effect on people, property and the environment.

304. A key area of environmental uncertainty is the potential impact on water levels of Thirlmere Lakes (section 8.3) which are located within a National Park and are part of the Greater Blue Mountains World Heritage Area. The Commission has imposed conditions to address this uncertainty and safeguard the lakes by ensuring updated information is considered and acted upon by the Applicant, through a process of monitoring and adaptive management.

305. Where necessary, the likely impacts of the Project have been managed by conditions of consent imposed by the Commission, which are intended to:

- avoid, minimise, or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- avoid and/or compensate for impacts which affect infrastructure and property;
- require regular monitoring and transparent reporting; and
- provide for the ongoing environmental management of the development.

9.2 The Suitability of the Site

306. The permissibility of the development is addressed in section 7.1 of this Statement of Reasons. Although the Wollondilly LEP permits the Project in some zones applying to the Site and would otherwise prohibit it in others, the Mining SEPP provides that mining is permissible on the Site.

307. The Commission accepts that there will be demand for high quality coking coal over the projected life of the mine and considers that there are significant environmental, social and economic benefits arising from extending the life of an existing mine, with suitable coal reserves and established infrastructure and environmental footprint, rather than developing a totally new mine.

308. The Project involves the extension of underground workings at an existing mine which has significant surface infrastructure already in place. Proposed new surface infrastructure is limited to two ventilation shafts, additions to the REA, and other minor upgrades and additions. The opportunity to utilise existing surface infrastructure, and the limited amount of new surface infrastructure proposed, are considered to be key benefits of the Site. Another significant benefit is the availability of an established functioning rail connection, which will remain the primary means of transporting product coal from the Site, minimising road-based transport and its associated impacts.

309. The proposed location of the new mining domain partially beneath residential areas has led to significant concerns being raised in submissions to the Commission and in the public hearing regarding the predicted subsidence damage to homes and the associated disruption to residents (section 8.1). The Commission has imposed conditions to improve access to appropriate restitution for subsidence related damage.

310. The location of the proposed underground mining domain has been informed by a detailed study of the environment most at risk of subsidence impacts, particularly watercourses. Subject to the condition imposed requiring shortening of longwalls LW103B and LW104B to avoid undermining Dog Trap Creek, the Commission considers that the Site location achieves an appropriate balance between coal extraction and avoidance of sensitive areas.

311. Two longwall panels are proposed directly beneath the Wirrimbirra Sanctuary (section 8.8) which is listed in the NSW State Heritage Register. Subsidence induced fracturing is predicted to cause loss of surface water and associated biodiversity impacts. Avoidance of directly undermining the sanctuary was not pursued by the Applicant owing to its potential impact on the financial viability of the project. Noting the performance criteria and mitigation obligations imposed through conditions of consent, including for watercourses within the sanctuary, the Commission has found that potential impacts to the sanctuary can be appropriately managed.

312. The Commission has also considered the suitability of the Site through assessment of the key issues addressed in section 8 of this Statement of Reasons.

9.3 Ecologically Sustainable Development

313. The principles of Ecologically Sustainable Development were addressed at section 7 of the Department's Assessment Report, which states:

> *The Department's assessment has sought to integrate all significant environmental, social and economic considerations. The Department considers that the Project can be carried out in a manner that is consistent with the principles of ecologically sustainable development.*

314. The Commission has applied the precautionary principle through its consideration of the potential environmental, social and economic impacts of the Project and by imposing conditions that require ongoing monitoring and review of environmental indicators and adaptive responses, and which set standards and performance measures for acceptable environmental performance.

315. The Commission has considered inter-generational equity in its assessment of the potential environmental, social, and economic impacts of the Project, including by imposing conditions seeking to mitigate the potential long-term environmental impacts of the Project and providing for appropriate post-closure rehabilitation of the Site.

316. The Commission has considered the need for conservation of biological diversity and ecological integrity through its assessment of the environmental impacts of the Project and by imposing conditions which avoid, minimise or offset adverse environmental impacts, including minimising clearing of a CEEC and minimising subsidence related surface water impacts.

317. In order to promote the principles of ecologically sustainable development, the Commission has also provided for improved valuation, pricing and incentive mechanisms, including provision for offset options GHG emissions which exceed defined thresholds and requirements for regular transparent reporting of the environmental impacts of the Project.

318. The Commission finds that, subject to the conditions imposed, the Project is consistent with the principles of ecologically sustainable development.

9.4 The Public Interest

319. The Department considered the public interest in section 7 of its Assessment Report and found

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

320. The Commission has considered the public interest in reaching its determination, including through the key issues discussed in section 8 of this Statement of Reasons which were informed by written submissions and presentations at the public hearing.

321. A key concern raised in submissions was subsidence (section 8.1), particularly the impacts the subsidence impacts on residences and the associated disruption and stress caused to residents. This concern was pronounced for properties at risk of protracted impacts from multiple longwalls. The Commission has reduced the severity and longevity of potential impacts of subsidence through the imposed conditions of consent which ensure access to appropriate restitution.

322. The Commission received many submissions in support of the Project that focussed on the economic benefits of the development (section 8.13), including to employees, suppliers and local businesses as well as broader impacts on the regional and national economies. Notwithstanding uncertainty about the accuracy of the Applicant's calculated NPV, the economic impacts of the Project are considered a benefit.

323. Having considered written submissions and representations at the public hearing and key issues in section 8, and subject to the conditions imposed, the Commission finds that, on balance, the Project is in the Public Interest.

10 CONCLUSIONS: THE COMMISSION'S FINDINGS AND DETERMINATION

324. The Commission has carefully considered the Material before it, as set out at section 5.

325. The views of the community were expressed through presentations to the Commission at the public hearing and in written submissions. The Commission carefully considered all these views as part of making its decision.

326. The Commission identified key issues, including subsidence, surface water, groundwater, biodiversity, air quality, noise, Aboriginal cultural heritage, historic cultural heritage, visual amenity, traffic, social impacts, human health, mine closure and rehabilitation, and GHG emissions.

327. The Commission has imposed conditions of consent designed to

- avoid, minimise, or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- avoid and/or compensate for impacts which affect infrastructure and property;
- require regular monitoring, transparent reporting and adaptive responses; and
- provide for the ongoing environmental management of the development.

328. The Commission agrees with the Department's findings, as set out at section 7 of the Department's Assessment Report, that the proposed extension of the existing Tahmoor Coal Mine is strategically justified and is in the public interest, and that the identified impacts can be appropriately managed through the conditions of consent imposed.

329. Based on its consideration of the Material, the Commission finds that the Application should be approved subject to the imposed conditions.

330. The reasons for the Decision are given in the Statement of Reasons for Decision dated 23 April 2021.

Professor Richard Mackay AM (Chair)
Member of the Commission

Professor Chris Fell AO
Member of the Commission