

MAJOR PROJECT ASSESSMENT

Mangoola Coal Project Modification 6 (06_0014 MOD 6)



Director-General's
Environmental Assessment Report

February 2014

Cover Photos: Mangoola Coal AEMR 2012 and EA 2013

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EXECUTIVE SUMMARY

Mangoola Coal Operations Pty Ltd (Mangoola Coal) is seeking to modify the project approval for the Mangoola Coal Mine near Muswellbrook in the Upper Hunter Valley (see Figure 1).

The proposal involves increasing the extraction rate from 10.5 to 13.5 million tonnes of run-of-mine coal a year, and various changes to the existing mining operations to facilitate the proposed increase. These changes include an increase in the number of employees, the number of excavators and trucks, and the number and size of blasts on the site. Other consequential components of the proposal involve changes to the final landform and the site water management system, including approval to discharge saline water to the Hunter River under the Hunter River Salinity Trading Scheme.

As a transitional Part 3A project, the approval would be modified under Section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Under Section 75W of the EP&A Act, the Minister for Planning and Infrastructure is the approval authority. However, under the Minister's delegation dated 14 September 2011, the NSW Planning Assessment Commission must determine the application. This is because there were more than 25 public objections to the proposal.

The Environmental Assessment (EA) for the proposed modification was publicly exhibited from 29 May 2013 until 28 June 2013. During the exhibition period, Planning & Infrastructure (P&I) received 75 submissions, including 8 from public authorities, 12 from special interest groups and 55 from the general public. None of the public authorities objected to the proposal. However, all of the general public submissions, and all but one of the special interest groups, objected to the proposal. The key issues raised in submissions related to noise, blasting, air quality, water quality, health, socio-economic issues and the impacts of the proposal on the local road network.

Mangoola Coal provided a formal Response to Submissions (RTS) to Planning & Infrastructure, which addressed the issues raised in all public and agency submissions. Planning & Infrastructure forwarded the RTS to all public agencies that had previously provided submissions and invited further comments. Planning & Infrastructure has undertaken additional consultation with various stakeholders and inspected the site and surrounding areas to inform its assessment of the proposal. Planning & Infrastructure also commissioned separate air quality and traffic assessments to assist in the detailed assessment of the cumulative impacts associated with the various mining operations to the west of Muswellbrook.

Following this extensive consultation process, Planning & Infrastructure has completed its assessment of the merits of the proposal, including consideration of all the potential environmental, social and economic impacts, and the relevant requirements of the EP&A Act.

In summary, Planning & Infrastructure believes that the proposal represents a reasonable and logical amendment to the existing Mangoola Coal Project, as it would maximise the economic benefits of the mine without any increase in the disturbance footprint. It would also maximise the use of the existing coal processing and transportation infrastructure, and create another 240 full time jobs.

These benefits must be offset against the potential impacts of the proposal. However, Planning & Infrastructure's assessment found that the proposal would not significantly increase the impacts over and above those approved for the existing Mangoola Coal Mine.

In relation to amenity and health impacts, the assessment found that the proposal would not result in any additional exceedances of the applicable air quality criteria, and there would be far fewer residences predicted to experience noise levels above the applicable noise criteria compared to the existing operations. This is a result of updated noise modelling which reflects actual monitoring data, and means that under the updated conditions of approval, Mangoola Coal would be required to operate within a smaller 'envelope of impacts' than is currently the case. In regard to blasting, Mangoola Coal is seeking to increase the number of blasts from 5 to 6 a week, and to remove the restriction on the maximum size of a blast on the site. Planning & Infrastructure believes that the management of blasting should be outcomes focused, and provided the blasting limits are adhered to, the existing blasting restrictions can be more flexible without any significant increase in the impacts on nearby residents.

In regard to other aspects of the proposal, Planning & Infrastructure is satisfied that the proposed alterations to the site water management system, including the proposed discharge of saline water into the Hunter River, would not result in any significant impacts on water resources. In this regard,

Planning & Infrastructure notes that any saline discharges would be undertaken in accordance with the Hunter River Salinity Trading Scheme administered by the NSW Environment Protection Authority. Planning & Infrastructure acknowledges that the proposed changes to the final landform may result in a marginal increase in visual impacts, but Planning & Infrastructure is satisfied that any impacts would be adequately offset by the fact that mining would cease 3 years earlier than is currently the case, and the long term benefits associated with a more natural final landform.

In regard to infrastructure and services, Planning & Infrastructure considers that the proposal would not result in any significant impacts, and that the revised offer under Mangoola Coal's Voluntary Planning Agreement with Muswellbrook Shire Council adequately addresses any additional demands on infrastructure and services. The exception is Thomas Mitchell Drive which is a Council road that is heavily used by the mining industry. The road is currently undergoing a major upgrade, and Planning & Infrastructure has commissioned a detailed traffic study to provide a basis for determining the appropriate contributions from the various mines in the area. Accordingly, Planning & Infrastructure has recommended that Mangoola Coal be required to contribute towards the upgrade and maintenance of this road in accordance with the recommendations of this study.

Finally, the proposal also seeks a minor change to the offset areas as Mangoola Coal has been unable to acquire two properties that were identified in the approved biodiversity offset strategy. Planning & Infrastructure is satisfied that the alternative areas proposed by Mangoola Coal comprise similar vegetation communities, and are located in areas that are consistent with the objectives of the biodiversity offset strategy to create habitat corridors with nearby areas of Crown land.

Based on its assessment, Planning & Infrastructure is satisfied that the proposal would not significantly increase the impacts of the approved project, and that the residual impacts can be adequately managed mitigated and managed through the implementation of the recommended conditions.

On balance, Planning & Infrastructure believes the benefits of the proposal outweigh its costs and it is in the public interest and should be approved, subject to stringent conditions.

1. BACKGROUND

1.1 Existing Operations

The Mangoola Coal Mine is located near Wybong in the Upper Hunter Valley, 20km west of Muswellbrook (see Figure 1).



Figure 1: Regional Context

The mine was approved by the then Minister for Planning on 7 June 2007, at which time it was known as the 'Anvil Hill Coal Project'. The mine commenced operations in September 2010, and is currently operated by Mangoola Coal Operations Pty Ltd, a wholly-owned subsidiary of Glencore Xstrata Pty Ltd.

Since 2007, Mangoola Coal has modified the project approval five times to allow various minor changes to its operations. The most significant of these changes was the relocation of the 500kV electricity transmission line that was located over the coal resource within the site.

The modified project approval allows Mangoola Coal to extract 150 million tonnes of coal over 21 years, at a rate of up to 10.5 million tonnes of run-of-mine coal per year, as well as construction of a range of associated infrastructure including coal processing, rail loading and water management facilities.

2.1 Site Context

The areas immediately surrounding the mine are dominated by various agricultural land uses comprising a mix of cropping and grazing. There are also a number of small vineyards and horse studs in the vicinity of the mine (see Figure 2).

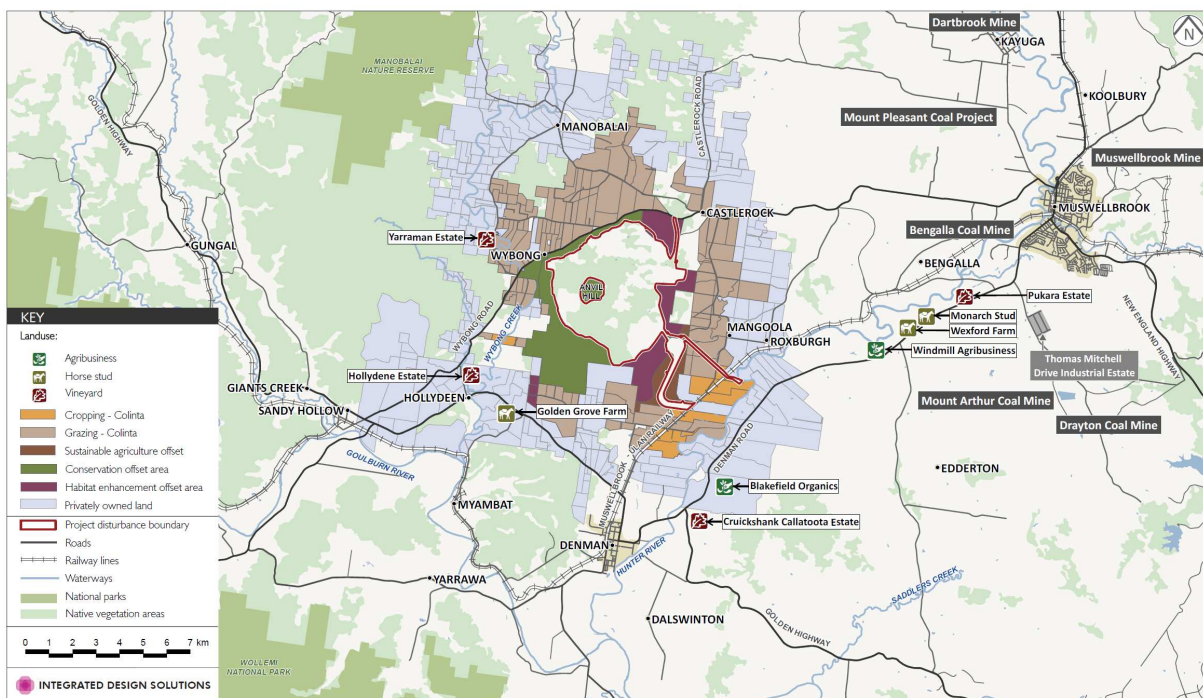


Figure 2: Major Surrounding Land Uses

There are three major coal mines to the east and southeast of the Mangoola Coal Mine – Bengalla Coal Mine, Mt Arthur Coal Mine and the Drayton Coal Mine (see Figure 2). The approved (but not yet operating) Mt Pleasant Coal Mine is also located to the east of the mine. However, it is important to note that the nearest of the operating mines are at least 7km from the Mangoola Coal Mine, and hence the potential for cumulative amenity impacts with these mining operations is limited.

There are a large number of rural-residential properties in the areas surrounding the mine. Glencore Xstrata now owns most of the properties immediately surrounding the mine (see Figure 3), but under the current approval, 63 properties remain in the management (53 properties) and acquisition (10 properties) zones due to the noise, dust and blasting impacts from the mine.

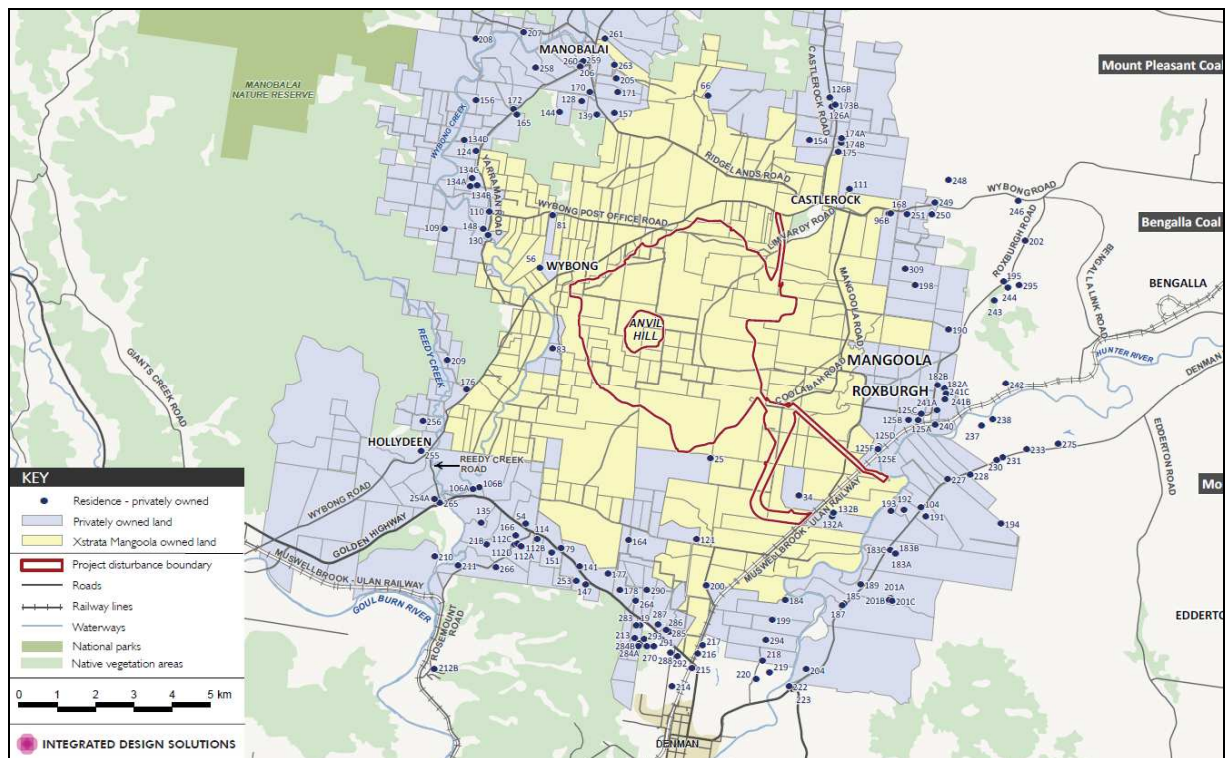


Figure 3: Land Ownership

The areas within the approved project boundary and land immediately to the west are dominated by vegetated undulating slopes leading to distinctive rocky outcrops. The dominant feature in the project area is Anvil Hill which is outside the disturbance footprint of the mine. Similar rocky outcrops exist to the west and southwest of the site, including Wallaby Rocks and Limb of Addy Hill. Further to the southwest and northwest of the site is the Manobalai Nature Reserve and Wollemi National Park (see Figure 2).

Under the existing approval, Mangoola Coal is required to secure over 3,000 hectares (ha) of biodiversity offsets in the areas surrounding the mine. These areas were identified and approved in 2007, and lie predominately on land owned by Mangoola Coal adjacent to the project boundary (see Figure 4). As can be seen from Figure 4, the location of the offsets were also designed to enhance connectivity with nearby areas of Crown land and the National Park reserve system.

The mine site is located predominantly within the Wybong Creek catchment with parts also located within the Anvil Creek, Sandy Creek, Big Flat Creek and Clarks Gully catchments, all forming part of the wider Hunter River catchment. Mangoola is able to extract water from the Hunter River and holds both general security and high security licences under the *Water Sharing Plan for the Hunter Regulated River Water Source*.

Road access to the site is via Wybong Road, and because project-related traffic is not permitted to use Wybong Road west of the site, almost all the traffic to/from the site uses Bengalla Link Road and Denman Road to the east. A large proportion of the workforce resides in Muswellbrook (40 percent) with other locations including Singleton and Maitland. Access to these areas would be via Thomas Mitchell Drive (which bypasses Muswellbrook), the Golden Highway, and/or the New England Highway.

Other infrastructure in the area includes the Muswellbrook-Ulan railway line which is used to transport coal from the site to the Port of Newcastle for export (see Figure 3), and a 500kV transmission line which is currently being re-located to the west of the mine by Transgrid in accordance with a 2012 approval.

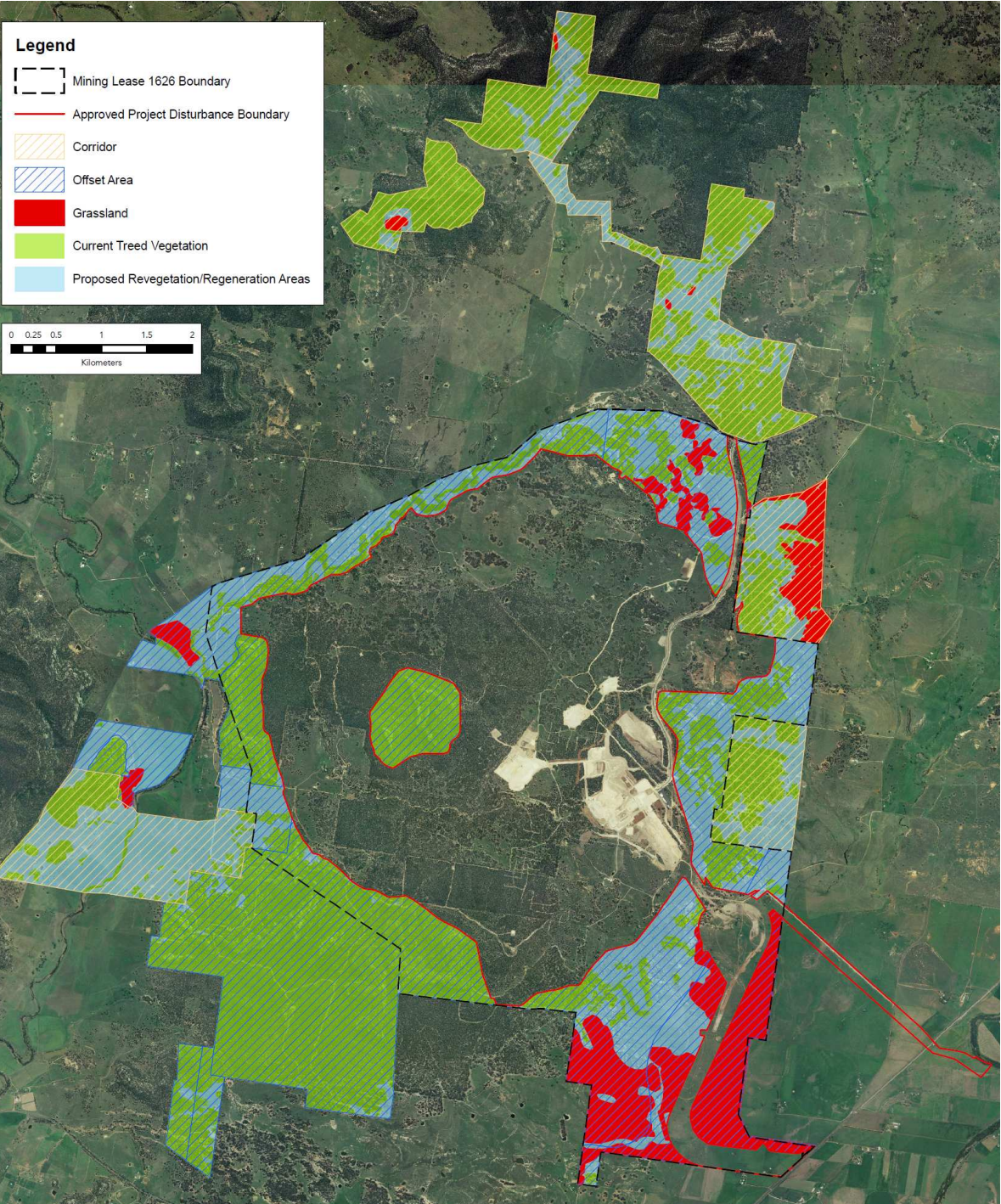


Figure 4: Biodiversity Offset Strategy

2. PROPOSED MODIFICATION

Mangoola Coal is seeking a further modification to its project approval under Section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The proposed modification is described in detail in the Environmental Assessment (EA) provided in *Appendix D*.

In summary, the proposed modification involves:

- increasing the extraction rate of coal at the site from 10.5 to 13.5 million tonnes a year;
- increasing the number of excavators and trucks to facilitate the increase in production;
- increasing the number of employees from 300 to 540;
- increasing the number of blasts from 5 to 6 a week;
- converting a temporary ROM coal stockpile to a permanent stockpile;
- minor changes to the design of the final landform, including an increase in the area of the final landform at the maximum approved height of 240m RL;
- using mined rock to produce gravel for various purposes on site;
- discharging saline water to the Hunter River under the Hunter River Salinity Trading Scheme (HRSTS);
- upgrading the water management system to cater for the increased rate of production; and
- replacing a portion of the approved offset area with an alternative offset.

All mining would remain within the approved footprint, but because of the proposed increase in extraction rate, the total life of the mine would be reduced by up to 3 years (i.e. from 2028 to 2025).

The intensification of mining has been proposed following various efficiency improvements made to the Coal Handling and Preparation Plant (CHPP) on site which would allow a greater proportion of the ROM coal to be processed on the site, and hence allow the total output of the mine to increase.

A comparison of the proposed modification compared to the approved project is provided in Table 1 below and shown in Figure 5.

Table 1: Comparison of the proposed modification with approved project

Component	Approved Project	Proposed Modification
Project Life	21 years	No change
Extraction Limit	10.5Mtpa	13.5Mtpa
Mining Methods	Open-cut truck and shovel operation	No change to method, but increase in total equipment fleet
Staging		In accordance with approved conceptual mine plan, however would progress at a faster rate
Mining Areas	Within approved disturbance boundary	No change
Coal Processing	CHPP which includes a Coal Preparation Plant (CPP). A by-pass system allows crushed coal to bypass the CPP and be transported directly to product coal stockpile area for transportation.	No change
Hours of Operation	7 days/week, 24hrs/day	No change
Operational workforce	Operational workforce of 300 personnel	Increase to 450 full-time operational employees, plus up to 90 contractors

Infrastructure	• CHPP and associated infrastructure; • Northern Access Road and Wybong Road intersection; • Rail infrastructure; • Administration and employee facilities; • Electrical power reticulation; • Telecommunication cables; • Water supply and sewage systems; • Tailings and water management infrastructure including Hunter River Pump Station and Hunter River Pipeline; • Workshop and refuelling facilities; • Lighting; and • Explosive storage.	No change except for: • Converting a temporary ROM stockpile to a permanent ROM stockpile; • Approval to discharge saline water to the Hunter River; • Additional water management infrastructure; and • On-site gravel production of up to 50,000 tpa for use on site.
External transport	Transport via rail, maximum of 10 trains per day	No change
Rehabilitation	Progressive rehabilitation, with maximum height of 240m.	Minor changes to design of final landform. Increased area of final landform to be located at maximum approved height of 240m.
Biodiversity offsets	• Biodiversity Offset Areas – 1,904ha • Corridors – 1,164ha	Minor change to identification of properties within offset area, total area remains unchanged.
Capital Investment Value	\$240m	Additional \$42m

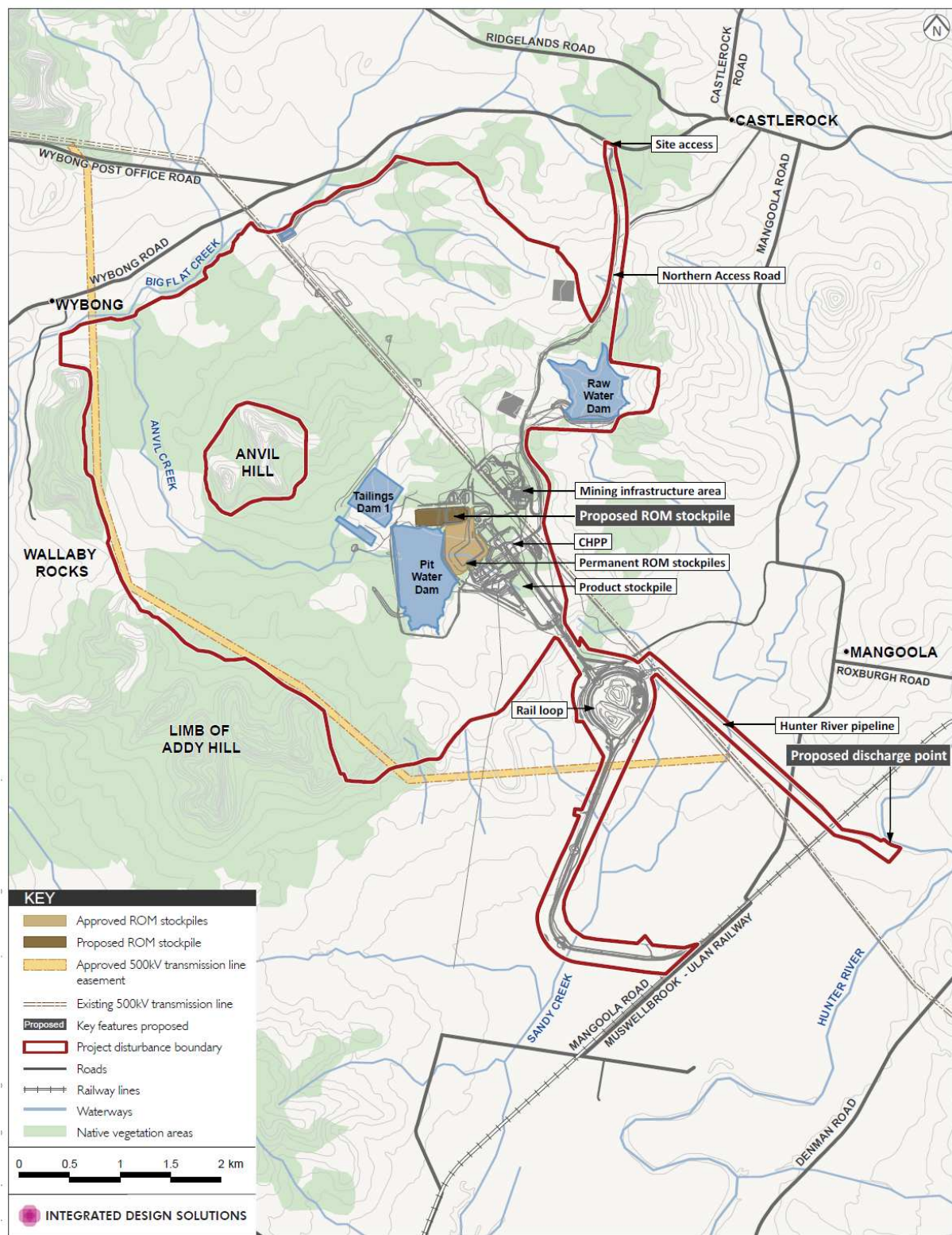


Figure 5: Proposed Modification

3. STATUTORY CONTEXT

3.1 Section 75W

Although Part 3A of the EP&A Act was repealed on 1 October 2011, the Mangoola Coal Project remains a 'transitional' Part 3A project under Schedule 6A of the Act, and hence any modifications to the project approval are to be made under Section 75W.

Planning & Infrastructure (P&I) is satisfied that the proposal should be characterised as a modification to the approved project rather than a new project in its own right as:

- the proposal would not change the mining, processing, and transportation methods;
- the proposal would not increase the approved disturbance area; and
- the proposal would not result in a significant increase of environmental impacts.

It is acknowledged that the proposal would increase the production rate at the mine, but the mining would remain within the approved footprint, and would be partly offset by the fact that the mine would cease operations around 3 years earlier than would otherwise be the case. Given these considerations, Planning & Infrastructure is satisfied that the proposal is within the scope of Section 75W, and may be determined accordingly.

3.2 Approval Authority

Under Section 75W of the EP&A Act, the Minister for Planning and Infrastructure is the approval authority for this modification application. However, under the Minister's delegation dated 14 September 2011, the PAC must determine the application. This is because there were more than 25 public objections to the proposal.

3.3 Integrated and Other Approvals

Under Section 75U of the EP&A Act, a number of other approvals have been integrated into the Part 3A approval process and are not required to be separately obtained for the project. These include:

- heritage related approvals required under the *National Parks and Wildlife Act 1972* and the *Heritage Act 1997*; and
- some water related approvals under the *Water Management Act 2000*.

Under Section 75V of the Act, a number of further approvals are required to be obtained, but must be approved in a manner that is consistent with any Part 3A approval for the project. This includes variations to the existing environment protection licence under the *Protection of the Environment Operations Act 1997*.

Planning & Infrastructure has consulted with the relevant government authorities responsible for these integrated and other approvals (refer to Section 4) and considered the relevant issues relating to these approvals in its assessment of the proposal. None of these authorities object to the proposal.

3.4 Environmental Planning Instruments

Planning & Infrastructure has considered the proposal against the relevant environmental planning instruments (see *Appendix C*), as well as Mangoola's consideration of these instruments (see *Appendix D*). Based on this consideration, Planning & Infrastructure is satisfied that these instruments either do not apply to the proposed modification or substantially govern the carrying out of the development.

In weighing up the merits of the proposal, Planning & Infrastructure has considered the significance of the coal resource in accordance with the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP), and concluded that:

- the resource approved for extraction comprises 150 million tonnes of relatively high quality coal (low sulphur content) that can be extracted at relatively low strip ratios (3:1), and can therefore be considered to constitute a highly significant coal resource for the region and more broadly for NSW;
- the proposal would also generate a range of economic benefits including:
 - an additional 240 jobs at the mine (300 up to 540);
 - maximising the efficiency of the approved mining operations and infrastructure on the site;
 - creating economies of scale and improve the financial position of the mine in the current market downturn; and
 - introduce additional flexibility in meeting export coal contracts across Glencore Xstrata's portfolio of mines in the Hunter Valley.

4. CONSULTATION

After accepting Mangoola Coal's application and associated Environmental Assessment (EA) for the proposal, Planning & Infrastructure exhibited the documents between 29 May 2013 and 28 June 2013.

Planning & Infrastructure made the EA publicly available:

- on Planning & Infrastructure's website (www.planning.nsw.gov.au);
- at Planning & Infrastructure's Information centre;
- at Muswellbrook Shire Council; and
- at the Nature Conservation Council office.

The exhibition was advertised in the Hunter Valley News, Newcastle Herald and the Muswellbrook Chronicle, and relevant State government authorities were notified of the exhibition by email.

During the exhibition, Planning & Infrastructure received a total of 75 submissions:

- 8 from public authorities, including Muswellbrook Shire Council;
- 12 from special interest groups; and
- 55 from community members.

A full copy of the submissions received during the public exhibition is attached in *Appendix E*.

Since the exhibition, Planning & Infrastructure has consulted further with Mangoola Coal, key public authorities (including Muswellbrook Shire Council), and some local residents to get a better understanding of the key issues, and inform the assessment of the merits of the project. This included a site inspection on 5 July 2013.

4.1 Response to Submissions

In August 2013, Mangoola Coal submitted a detailed response to the issues raised in submissions (see *Appendix F*), which was made publicly available on Planning & Infrastructure's website. The Response to Submissions (RTS) was also forwarded to public authorities to determine whether these authorities had any residual concerns about the proposal.

A summary of the issues raised during the exhibition and in response to the RTS is provided below.

4.2 Public authorities

None of the public authorities objected to the proposed modification. However, most of the authorities raised concerns and/or made recommendations in relation to a range of issues as described below.

The **Environmental Protection Authority (EPA)** raised concerns about the predicted exceedances of the Project Specific Noise Levels (PSNLs) and the need to justify any such exceedances in accordance with the INP. The EPA also questioned whether all reasonable and feasible measures to reduce noise impacts had been considered, and whether there is a risk of dirty water from the mine being mixed with saline water that would be discharged to the Hunter River.

Planning & Infrastructure is satisfied that Mangoola Coal has investigated all reasonable and feasible measures to reduce noise levels and that the existing mitigation and management measures are consistent with industry best practice. The RTS details the existing measures that are currently implemented by Mangoola Coal to address the EPA's concerns relating to surface water management.

The **Division of Resources and Energy (DRE)** within the Department of Trade and Investment, did not object to the proposal, but requested further details be provided in relation to rehabilitation at the mine, including impacts of the final landform on surface water management, integration of the final landform with the surrounding landscape, and the change to the rehabilitation schedule. Following a meeting with Mangoola Coal, DRE confirmed to the proponent that these issues should be addressed in the Mining Operations Plan (MOP). Mangoola Coal has committed to addressing these issues when the MOP is updated to reflect this modification. DRE has raised no further concerns.

The **Department of Primary Industries (DPI)** did not object to the proposal but raised concerns regarding the proposed increase in saline water entering the Hunter River and asked for the proponent to implement a suitable monitoring program to determine any significant impacts on the aquatic biota in the Hunter River. Planning & Infrastructure has recommended conditions that require Mangoola

Coal to monitor discharges to the Hunter River in accordance with the Hunter River Salinity Trading Scheme.

The **NSW Health** raised a number of concerns relating to the potential health impacts of the proposed modification, and whether the tenants of mine-owned properties had been consulted about the potential noise impacts of the modification. NSW Health also raised concerns about the potential air quality impacts of the proposed modification, and the need to consider the incremental increase in particulate matter not just exceedances of the EPA criteria. Impacts on drinking water supplies and the social impacts of the proposed modification were also raised.

In regard to consultation with tenants residing in mine-owned properties, Planning & Infrastructure is satisfied that Mangoola Coal has appropriately advised tenants of the potential impacts of the project. The conditions will still require Mangoola Coal to consult with their tenants regarding the potential impacts.

Mangoola Coal addressed NSW Health's concerns regarding significant incremental air quality impacts in the RTS, indicating that there are currently no standards or criteria to determine what represents a significant increase. Whilst NSW Health accepted the response, indicated it is working on a criteria to guide the assessment of acceptable increased particulate impacts.

To respond to the potential cumulative air quality impacts from the mines to the west of Muswellbrook, Planning & Infrastructure commissioned a study to investigate the cumulative impacts associated with the Mangoola, Bengalla and Mount Arthur coal projects. The results of this study are discussed in *Section 5.3*.

The **Roads and Maritime Service (RMS)** did not object to the project and considered that the modification would not result in any significant impact to the classified road network. However, RMS encouraged the upgrade of the Denman Road and Thomas Mitchell Drive intersection to be brought forward as it would improve safety and efficiency for road users. Planning & Infrastructure has recommended a condition requiring Mangoola Coal to contribute to the upgrade and funding of this intersection, to be agreed by the Director-General.

The **Office of Environment and Heritage (OEH)** did not object to the modification or raise any issues.

Muswellbrook Shire Council (Council) raised a number of long standing concerns it has had with the Mangoola Coal Project, but many of these concerns are not directly relevant to the proposed modification. In regard to the proposed modification, Council raised concerns about:

- the need to consider existing elevated noise and air quality levels in the Wybong valley;
- any potential increase to the size of the final void;
- the need to ensure the final landform incorporates micro-relief;
- the discharge of saline water to the Hunter River; and
- the need to address additional impacts on the road network through revisions to the existing VPA.

Council raised no further concerns in response to the RTS

4.3 Community and Special Interest Groups

All but one of the submissions from the public including the special interest groups objected to the proposed modification.

Special interest groups that made submissions on the proposal were:

- Hunter Communities Network;
- Hunter Equine;
- Hunter Thoroughbred Breeders Association;
- Hunter Environmental Lobby Inc;
- Redman Park Pty Ltd;
- Rivers SOS;
- Upper Hunter Tours;
- Upper Hunter Holdings;
- Two Rivers Wines;
- Darley Australia;
- Construction Forestry Mining and Energy Union; and

- Wybong Action Group.

While submissions from interest groups and individuals raised a broad range of issues about the impacts of mining in general, the key issues relevant to the consideration of the proposal were:

- *Noise and blasting* – increased noise levels and changes to noise acquisition and management zones;
- *Air quality* – concerns regarding health related impacts and increased dust levels;
- *Traffic* – increased traffic and impact on existing roads;
- *Water resources* – objection to the discharge of saline water to the Hunter River;
- *Agriculture* – impacts on surrounding agricultural enterprises;
- *Visual* – concern regarding lighting at night and increased visual impacts; and
- *Final landform* – insufficient detail regarding the final landform and long term surface water impacts.

4.4 Additional Assessment

To address the concerns raised about the potential cumulative impacts of mining on air quality and traffic to the west of Muswellbrook, Planning & Infrastructure commissioned two expert reports – a cumulative air quality assessment prepared by Todoroski Air Sciences, and a traffic assessment prepared by GHD, which provides a basis for apportioning contributions from mining companies for the upgrade and maintenance of Thomas Mitchell Drive. The findings and recommendations of these additional studies are considered in the applicable sections in the assessment below.

5. ASSESSMENT

In assessing the merits of the proposal, Planning & Infrastructure has considered:

- the EA, submissions, and RTS for the proposal;
- relevant content of previous EA's for the project, current environmental management plans and monitoring results;
- the current project approval;
- the provisions of relevant EPIs, policies and guidelines; and
- relevant provisions of the EP&A Act, including the objects of the Act.

The following is a summary of the findings of this assessment.

5.1 Noise

Introduction

A detailed noise assessment was undertaken for the proposed modification by EMM and peer reviewed by Wilkinson Murray. The assessment was undertaken in accordance with the *Industrial Noise Policy* (INP) and other relevant guidelines.

In particular, the assessment considered the potential changes to noise and vibration impacts associated with:

- changes to the staging and sequencing of mining;
- increased plant and equipment numbers on the site;
- increased traffic noise on the local road network;
- crushing and processing of gravel;
- changes to blasting frequency and charge limits; and
- the increase in the area of overburden emplaced at the approved maximum height.

In general, both Planning & Infrastructure and the EPA are satisfied that the noise assessment undertaken is robust and provides a sound basis for the characterisation and consideration of the impacts associated with the proposed modification. This conclusion is supported by the fact the noise model for the site was updated in accordance with measured noise monitoring data, and should therefore provide a more accurate indication of the actual noise impacts of the mine on surrounding residents than in the past.

Nonetheless, it is important to note that more than two-thirds of submissions from the community raised concerns regarding potential noise and blasting impacts, including that:

- noise from the mine is already too high and not complying with the existing limits, and the proposal would make this worse;

- the existing noise limits do not adequately protect the local community from intrusive noise impacts;
- cumulative noise impacts have not been adequately assessed;
- the existing noise management and acquisition zones should not be reduced;
- infrasound (or low frequency noise) impacts from the CHPP should be considered further; and
- some properties had not been included in the EA.

Existing Noise Environment

Mangoola Coal currently owns the majority of properties adjacent to the mine (see Figure 2). Under the existing project approval, there are 10 residences/vacant properties in the noise acquisition zone and 53 residences in the noise management zone. There are also 6 properties in the noise management zone as a result of traffic noise on Wybong Road and the Bengalla Link Road.

The majority of privately-owned properties in the areas surrounding the mine are largely unaffected by noise from other mines in the area. Consequently, the background noise is typical of a quiet rural area with background levels well below the minimum set by the INP of 30 dBA. This has resulted in privately-owned properties outside the noise management zone having noise limits of 35 dBA, which is the minimum intrusive criteria available under the INP, and is well below the recommended amenity night time criteria for rural areas of 40 dBA.

In recognition of the quiet background noise levels in the area, the existing approval provides additional noise mitigation for any privately-owned residence where the noise limits are set at or above 35 dBA.

Mangoola Coal operates an extensive noise monitoring network around the mine that uses a combination of real-time and attended noise monitoring. The real time monitoring is used for managing noise on the site, and the attended monitoring must be conducted quarterly to determine compliance with the applicable noise limits. Results of the noise monitoring undertaken in the past three years, indicates that Mangoola Coal is complying with the existing noise limits.

Mitigation Measures

Mangoola Coal currently implements a range of noise mitigation on the site, in accordance with its approved Noise Management Plan. Key mitigation measures include:

- restricting operation of haul trucks on overburden emplacement areas during the night;
- using noise attenuated mining equipment on the site;
- using silent horns, broadband reverse alarms and rubber tyred dozers at night;
- acoustic treatment of the CHPP; and
- a real-time noise management system.

In general, Planning & Infrastructure considers that the existing noise mitigation, management, and monitoring measures employed by Mangoola Coal are consistent with best practice in the industry.

However, to address EPA's concerns about demonstrating all reasonable and feasible mitigation measures, Mangoola Coal has investigated a number of additional measures to reduce the noise generated by the mine, including:

- restricting night time gravel crushing operations under adverse weather conditions;
- constructing temporary noise bunds on overburden areas and haul roads; and
- using "trolley assist systems" to automate truck movements on haul roads.

Of these options, Mangoola Coal is proposing to limit the gravel crushing operations to day-time only, but claims that the other measures are not reasonable or feasible as they would have a significant economic or operational impact on the mine.

In considering this matter, Planning & Infrastructure notes that the noise modelling (see below) indicates that there would be a significant reduction in the *predicted* noise impacts of the mine when compared to the existing noise predictions. This reduction is primarily due to a revised noise model that has been validated against recent noise monitoring results, rather than any decrease in the actual noise generated by the mine.

However, Planning & Infrastructure notes that the mine is currently operating within a noise envelope that was established when the mine was first approved, and that as a result of this modification, Mangoola Coal would now be required to operate within a significantly reduced noise envelope. Given

this, and the extensive noise mitigation measures already in place, Planning & Infrastructure is satisfied that additional noise mitigation measures are not warranted in this case.

Operational Noise

The noise modelling for the proposal assumed that all the existing noise mitigation measures would be implemented, that all plant and equipment were operating simultaneously at full power, and assessed the revised conceptual mine plans for Years 2 (end 2015), 5 (end 2018) and 10 (end 2023), which represent the worst case noise scenarios.

In summary, the assessment indicates that in almost all cases the noise impacts of the mine would be less than previously predicted (see Figure 6). In particular, the modelling indicates that under the modified operations 28 privately-owned residents are likely to be equal to or exceed the PSNL of 35 dBA in the areas surrounding the mine. This compares to the current situation where 63 privately-owned residences are predicted to experience exceedances of the PSNLs. A comparison of the predicted exceedances with the existing approval is presented in Table 2.

Table 2: Comparison of predicted exceedances for proposed modification with existing approval

Noise Exceedance	Additional Mitigation	Number of Properties	
		Current	Proposed
Residences 35-40dBA (i.e. equal to PSNL or 1-5 dBA above PSNLs)	Additional noise mitigation at the residence	53	25
Residences > 40dBA (i.e. >5dBA above PSNLs)	Acquisition	6	3
Vacant Land > 40dBA (i.e. >5dBA above PSNLs)	Acquisition	4	0
TOTAL		63	29

Acquisition and Management Zones

The updated noise modelling has resulted in some changes to the existing acquisition and management zones for the mine.

In particular, there are 38 properties that are now predicted to comply with the noise criteria that were previously in the noise management or noise acquisition zone for the mine. However, there is also one residence that is predicted to exceed the noise criteria by 2dBA that was previously predicted to comply, and another residence that was not identified in the original approval.

The management of changes to the existing management and acquisition zones was raised in a number of submissions on the proposed modification. Landowners are concerned that they may lose their rights to require Mangoola Coal to acquire their properties and/or implement additional noise mitigation at their residence.

To address this issue, Mangoola Coal is proposing to offer a 12 month 'grace' period for the 6 landowners that would no longer be in the acquisition zone. Two landowners made submissions claiming that their acquisition rights should remain, and if these rights were to be removed, that the 12 month grace period was insufficient.

However, Planning & Infrastructure considers that the 12 month grace period provides a reasonable period over which the affected landowners can decide whether or not they should trigger the acquisition process under the project approval. It is also important to note that this grace period only relates to triggering the acquisition process, as it may take considerably longer for the process to be completed under the Planning & Infrastructure's land acquisition process. Further, the 3 properties (with residences) that would be removed from the acquisition zone would continue to have additional noise mitigation rights for their residences which can be triggered at any time.

In addition to the grace period, under Condition 4 of Schedule 4 to the project approval, landowners are able to request an independent review if they believe they are experiencing noise levels above the noise limits in the project approval.

In regard to the noise management zone, which entitles landowners to have a range of additional noise mitigation measures installed at their residence, Mangoola is not proposing to offer any grace period to the 36 affected landowners that would lose this right. However, it is important to note that 21 of these residences have already received, or have already requested additional mitigation measures. Consequently, there are only 15 residences where the loss of this 'right' would have a material consequence.

As discussed above, Planning & Infrastructure is satisfied that the noise assessment is robust and accurate and provides a reasonable basis for re-defining the boundaries of the management zone for the mine.

In regards to the grace period for the 15 affected landowners, Planning & Infrastructure notes that Mangoola Coal has undertaken extensive consultation in the local area in regard to the proposed changes to the acquisition and management arrangements for the mine, including:

- Initial community workshop (December 2012);
- Community newsletters (November 2012 and July 2013);
- Fact sheet (May 2013);
- Face to face meetings (May/June 2013); and
- Website regularly updated.

In other words, landowners affected by this issue, have been adequately informed and had the opportunity to trigger the noise mitigation at their residences if they wished to do so. Given this, and the fact that the predicted impacts of the mine are expected to comply with the noise criteria at these residences, there seems little justification for Planning & Infrastructure to require Mangoola Coal to mitigate for an impact that no longer exists.

Finally, in regard to the limit at which additional noise mitigation is applicable, the current conditions provide this right where noise is equal or greater than 35 dBA. Mangoola Coal is seeking to modify this condition so that additional mitigation is only triggered where the noise levels *exceed* 35 dBA.

In considering this issue, Planning & Infrastructure notes that the original assessment of the project recommended that additional noise mitigation apply where noise levels *meet or exceed* the PSNL of 35 dBA due to the relatively low background noise levels that prevailed in the locality when the mine was proposed. Planning & Infrastructure sees no reason to fundamentally change its original assessment of this matter, and has therefore retained this requirement in its assessment of the proposal. Accordingly, the modified approval affords additional mitigation rights to privately-owned residents where the noise levels in the EA are predicted to be ≥ 35 dBA.

However, consistent with current practice, the modified approval does not make provision for additional noise mitigation based on subsequent monitoring of the noise impacts. Instead, Mangoola Coal would be required to comply with its noise levels at all privately-owned residences. If the mine is not able to comply, it would be required to modify its mining operations to ensure that it does so, or reach a negotiated agreement with the landowner to allow noise levels greater than the criteria in the approval.

Planning & Infrastructure believes this is a reasonable approach that balances the need to provide appropriate mitigation to residents predicted to experience noise levels at or above the applicable criteria, and the need to provide an incentive for the mine to operate with the approved envelope of impacts.

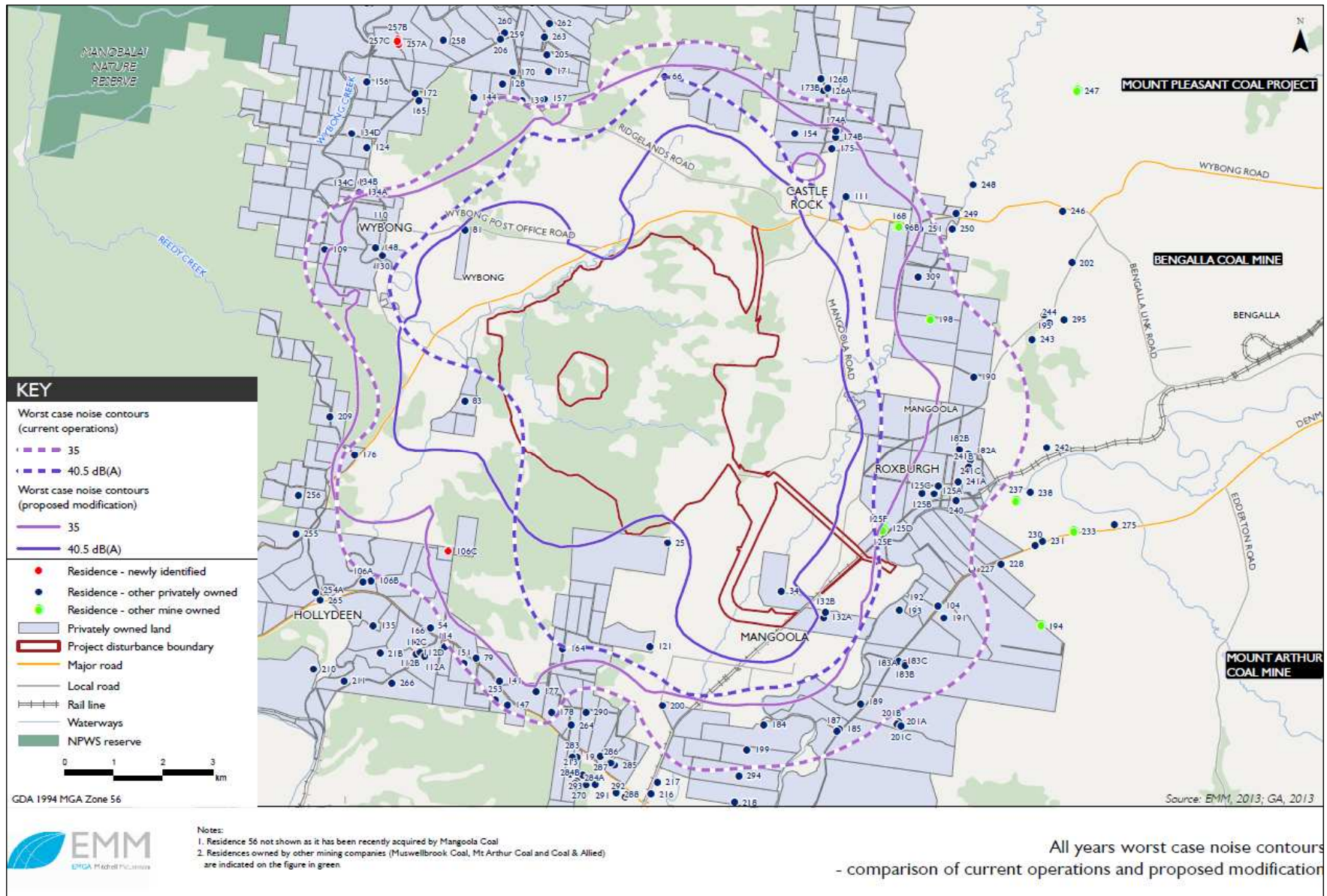


Figure 6 - Comparison of noise contours

Mine-Owned Properties

Mangoola Coal owns 61 properties surrounding the project with 49 currently tenanted and 12 vacant. Of these 61 properties, the noise criteria of 35 dBA is predicted to be exceeded at 56 (i.e. 92%), and above the INP maximum amenity criteria of 45 dBA at 13 properties (i.e. 21%). For the tenanted properties, a negotiated noise agreement is in place between Mangoola Coal and the tenants for all of these properties under the terms of the tenancy agreement.

NSW Health raised concerns regarding noise impacts for the tenants of these properties and whether the tenants have been consulted regarding the potential health risks. Under Condition 3 of Schedule 4 to the project approval, Mangoola Coal is required to develop a brochure to advise landowners and or future tenants of possible health and amenity impacts of the project and the tenancy agreement includes a section on the possible effects of mining, including noise impacts and explains that the property may experience exceedances above the criteria. Mangoola Coal provides all prospective tenants with a copy of the brochure prior to entering into a tenancy agreement. At any time tenants can make a written request to Mangoola Coal if they believe the mining related impacts are unacceptable, and if the issue cannot be resolved, the tenants can terminate their agreement without penalty. Given this, Planning & Infrastructure is satisfied that the tenants have been made aware of the potential health implications of noise generated by the mine, and the existing conditions of approval adequately address this issue.

Low Frequency Noise

Low frequency noise from mining is generally not at levels high enough to impact the amenity of surrounding residents. The noise assessment tested for low frequency noise at 13 representative receptor locations around the mine. The mine as a whole, and all the individual sources on the site that have the potential to result in low frequency noise impacts, passed the modifying factor test as stipulated in the INP, with the exception of the CHPP.

When the 5 dBA modifying factor was applied to noise from the CHPP in accordance with the INP, the assessment indicates that there would be a minor increase of 1 dBA at 3 of the 13 assessed locations to the south and east of the mine. However, 2 of these residences are owned by Muswellbrook Coal, and the other privately-owned residence already has acquisition rights under the existing Mangoola approval. No changes to the noise levels were predicted at other locations as a result of applying the modifying factor to the CHPP.

Overall, Planning & Infrastructure is satisfied that there would be no significant low frequency noise impacts associated with the operations of the mine, or any appreciable increase when compared to the existing operations.

Sleep Disturbance

Exceedances of the EPA's sleep disturbance criteria are predicted at 2 privately-owned residences. However, both of these residences are already in the acquisition zone. The existing approval includes the EPA's sleep disturbance criteria, and Mangoola Coal is required to monitor to demonstrate compliance with this criteria. Consequently, Planning & Infrastructure considers that no additional conditions are required to adequately regulate this issue.

Cumulative Noise Assessment

The nearest significant industrial noise source is the Bengalla Coal Mine located 14km to the east of Mangoola. While noise from Bengalla may influence noise at residences well to the east of Mangoola, the separation between the two mines means that significant cumulative noise is very unlikely. This is supported by the fact that noise enhancing winds from either direction would tend to enhance noise from one of the mines at certain receptors, but reduce noise from the other mine at those same receptors. Further, the overall noise envelope for Mangoola is predicted to reduce significantly when compared to the existing approved limits. Hence, Planning & Infrastructure is satisfied that the proposal would not materially increase the cumulative impacts of mining.

Given this, Planning & Infrastructure has recommended that cumulative noise limits be removed from the conditions of approval as they provide no meaningful protection to the community, and have the potential to result in uncertainty in the regulation of noise at the mine. Planning & Infrastructure is satisfied that the requirement for Mangoola to comply with its project-specific noise limits is more than sufficient to protect the community from unacceptable noise impacts.

Road and Rail Noise

The EA assessed road noise along Wybong Road and the Bengalla Link Road to the east of the mine, as there is very little mine-related traffic using the local road network to the west of the mine (see Figure 7).

The proposal would increase traffic movements due to the increase in the number of employees at the mine from 139 to 278 light vehicles per hour in both the am and pm peaks on Wybong Road. Heavy vehicles on Wybong Road would also increase from 82 to 107 each day. However, these heavy vehicles movements would be spread throughout the day, and are unlikely to significantly contribute to maximum road noise that occurs during the morning and evening shift changes at the mine.

Under the existing approval, there are currently 6 receptors that are entitled to additional noise mitigation as a result of road noise: 4 are located along Wybong Road and 2 are located along the Bengalla Link Road. However, only 2 of these residences are currently in private ownership with the other 4 now owned by other mining companies in the area.

The assessment indicates that road noise levels along Wybong Road would increase by up to 2.9 dBA with the maximum predicted noise levels at residences on Wybong Road about 5 dBA over the criteria (i.e. around 60 dBA). The predicted increase is above the recommended 2 dBA increase specified in the *NSW Road Noise Policy* where road noise is already above the applicable criteria of 55 dBA during the day. However, it is important to note that only one *additional* residence is predicted to exceed the road noise criteria as a result of the proposal, and this residence already has noise mitigation rights as a result of operational noise from Mangoola.

Overall, the scale of the impact would be similar to the approved project, and while 3 privately-owned residences would experience greater road noise impacts, these residences were already expected to experience significant noise impacts from the mine, and hence were already entitled to additional mitigation. Under the modified approval, these entitlements would remain, and Planning & Infrastructure considers this is a reasonable outcome for these properties. It should also be noted that these impacts would be based around the morning and afternoon peak periods, with the traffic noise for the remainder of the day/night period unlikely to exceed the criteria.

Finally, in regard to train noise, the proposal would not increase the approved maximum number of trains per day, and hence rail noise impacts have not been assessed further.

Conclusion

Noise has always been a key issue for the Mangoola Coal Mine, and Planning & Infrastructure considers that the proposed modification provides an important opportunity to revise the noise limits of the Mangoola Coal Mine in line with monitoring data collected over the last few years.

In so doing, Planning & Infrastructure is able to more accurately assess where the mine is likely to comply or exceed the applicable noise criteria, and to modify the management and acquisition obligations for Mangoola Coal accordingly. It also enables mitigation to be targeted to address actual impacts, and provides more certainty for Mangoola Coal and the local community. Even with the proposed intensification of mining, this process has resulted in a significant reduction in the number of local residences where noise is expected to exceed the applicable criteria.

Planning & Infrastructure is satisfied that the noise mitigation, management, and monitoring regime implemented by Mangoola Coal on the site is generally consistent with best practice, and that the existing conditions of approval are sufficiently robust to allow Planning & Infrastructure to regulate the site.

However, Planning & Infrastructure has updated a number of the conditions of approval to:

- reflect the changes to residences entitled to acquisition and/or additional noise mitigation;
- require a 12 month grace period for the 6 receptors moving out of the noise acquisition zone;
- update the conditions from quarterly to monthly attended monitoring to reflect current monitoring practice for the project; and
- update the noise impact assessment criteria to reflect the revised noise modelling.

Under Condition 7 of Schedule 5 to the existing project approval, Mangoola Coal is also required to update its Noise Management Plan and associated Noise Monitoring Program to reflect the changes associated with this modification.

5.2 Blasting

Introduction

Due to the intensification of mining operations, Mangoola Coal has identified a need to increase the frequency of both smaller and larger blasts on the site. To facilitate this, Mangoola Coal is proposing a number of specific changes to the existing conditions of approval to:

- increase the frequency of blasts on the site from 5 to 6 per week (averaged over 12 months);
- remove the condition which restricts blasting to 1 blast *per week* with a maximum instantaneous charge (MIC) greater than 1,500kg;
- remove the condition which restricts blasting to 1 blast *per day* with a MIC greater than 1,500kg; and
- increase the vibration criteria for the 500kV transmission line towers from 50mm/s to 100mm/s.

Size and Frequency of Blasts

Currently, more than 35% of blasts on the site are relatively small, and are used when mining is proposed in proximity to infrastructure or where it may have an impact on nearby residents. These blasts are designed to be inaudible at privately-owned residences, and hence Mangoola Coal claims that marginally increasing the frequency of this type of blast would not result in any additional impacts on the community. In regard to larger blasts, Mangoola Coal notes that increasing the frequency of larger blasts would not only allow it to increase production, but would also reduce the need for a greater number of smaller blasts.

In considering this matter, Planning & Infrastructure notes that the limit on the frequency of larger blasts was placed on the operations when the mine was originally approved to protect the amenity of nearby residents. However, over the last few years Mangoola Coal has been able to purchase many of the properties surrounding the mine to create a significant buffer between the mine and the vast majority of privately-owned residents. It has also been able to collect site specific data which has allowed it to more accurately determine blast compliance distances. The data is also supported by blast monitoring that demonstrates that Mangoola Coal has complied with its airblast and vibration limits for blasting at all privately-owned residences. For example, a review of the complaint records at the mine, indicates that blasting accounted for only 2.2% of complaints in 2012.

Given these considerations, Planning & Infrastructure believes it is reasonable to provide the required degree of blasting flexibility requested by Mangoola Coal to facilitate the proposed increase in production. That said, Planning & Infrastructure notes that Mangoola Coal would be required to comply with the existing blasting limits under the project approval, and to revise its existing Blasting Management Plan to formalise the specific measures to be implemented to manage the proposed changes to the blasting regime on the site. With these safeguards in place, Planning & Infrastructure is satisfied that the proposed changes to the size and frequency of blasts would not result in any significant impact on the local community.

Blast Criteria

TransGrid is currently relocating the 500kV transmission line outside the project boundary. However, it is expected to take at least another 10 months for this project to be completed, and the existing towers to be removed. In the meantime, Mangoola Coal is seeking an increase in the vibration limits for the 'suspension' transmission line towers on the site from 50mm/s to 100mm/s peak particle velocity (ppv). The vibration criteria for the 'tension' transmission line towers (which are under more strain) would remain at 50 mm/s.

Planning & Infrastructure notes that there is a formal agreement in place between Mangoola Coal and TransGrid which allows the proposed increase in the vibration criteria. Consequently, Planning & Infrastructure has no objections to amending the criteria accordingly. However, it is important to note that there are no changes proposed to the applicable vibration criteria for privately-owned residences in the existing approval. Planning & Infrastructure has recommended that the interim vibration criteria for heritage items and rock shelters in the conditions be replaced by a condition that requires Mangoola Coal to ensure that there is no damage to heritage items or rock shelters.

Conclusion

Given that Mangoola Coal would be required to continue to meet the existing blasting criteria, Planning & Infrastructure considers that the proposed changes to the blasting restrictions would not result in any significant impacts on the amenity of nearby residents. This is supported by monitoring data and the results of the modelling that demonstrate that the mine is complying with its existing

blasting limits, and can continue to do so even with significantly larger blasts. Planning & Infrastructure also notes that this is consistent with an outcome-based approach which seeks to balance operational flexibility by avoiding the imposition of arbitrary restrictions on the MIC of blasts, while ensuring that the amenity of the community is adequately protected.

5.3 Air Quality

Introduction

A detailed air quality and greenhouse gas assessment was undertaken for the proposal and peer reviewed by Dr Nigel Holmes. The assessment was undertaken in accordance with the NSW EPA's *Approved Methods for Modelling and Assessment of Air Pollutants*.

While the proposal involves mining within the approved footprint, the increased intensity of mining would result in some minor increases in the dust emissions from the site due to:

- an increase in the mining fleet;
- an increase in the size and frequency of blasting; and
- crushing of gravel on the site.

There would be no change in dust emissions from coal trains, as the proposal is not seeking any increase in the approved maximum number of trains accessing the site.

Similar to noise, air quality is a key concern of the local community with around 64% of public submissions raising concerns about the potential additional air quality impacts associated with the proposed modification. In particular, submissions raised concerns about:

- health-related impacts;
- increased dust levels at residences;
- impact on drinking water supplies; and
- compliance with current conditions.

Existing Air Quality Environment

Mangoola Coal maintains an extensive air quality monitoring network around the mine which indicates that annual average background concentrations of PM₁₀ remain well below the relevant EPA air quality criteria of 30 µg/m³ (typically below 20 µg/m³). In regard to short term dust concentrations, the monitoring data indicates that 24 hour maximum concentrations of PM₁₀ generally comply with the applicable assessment criteria of 50 µg/m³ in the areas surrounding the mine. These results are consistent with the EPA's regional air quality network that has a monitor at Wybong, approximately 9 km north of the mine which measured annual average PM₁₀ concentrations of 15.4 µg/m³ during 2012.

Mitigation Measures

Mangoola Coal currently implements a range of dust mitigation measures on the site that have been designed to reflect those outlined in the recent benchmarking study prepared by Katestone Environmental for the control of dust emissions from coal mines in NSW. The measures in this study have been adopted by Planning & Infrastructure and the EPA as representing current best practice in the mining industry.

Key mitigation measures include:

- restrictions on dust-generating activities on extremely windy days;
- installation of an automatic alarm system to inform the mine when dust levels are approaching the relevant criteria;
- use of water sprays at coal handling transfer points, stockpile areas and automatic sprays on dump hopper and the coal crushing plant;
- use of water carts on haul roads and unsealed working areas;
- enforcement of haul truck speed limits on the site; and
- progressive site rehabilitation and revegetation to minimise the area of disturbance at any one time.

Overall, Planning & Infrastructure considers that the dust mitigation, management and monitoring currently being implemented by Mangoola Coal is consistent with the current best practice for the control of dust emissions from coal mines in NSW, and there is limited opportunity for further substantial improvement.

Air Quality Impacts

Incremental Impacts

There is limited information in the EA about the incremental increase in dust emissions from the site as a result of the increase in production. However, in response to concerns raised by NSW Health, the response to submissions indicates that the incremental increase in dust emissions would be proportional to the proposed increase in production – in this case 22%. However, this proportion would vary according to the location of the mining in relation to different receptors around the mine. Nonetheless, it provides a good indicator of the incremental air quality impacts of the proposal when compared to the approved operations.

The air quality assessment indicates that the mine by itself (with the proposed increase in production) would exceed the PM₁₀ 24 hour criteria of 50 µg/m³ at 1 privately-owned residence (Receptor 83) and 33 mine-owned residences. However, the privately-owned residence already has acquisition rights under the current approval as a result of significant air quality impacts, and the proposed modification would not substantially increase the impacts at this property. The management of air quality on mine-owned properties is considered further below.

In regard to other dust concentration parameters (i.e. annual average PM₁₀, TSP and Deposited Dust, the incremental contribution of the mine (with the proposed increase in production) would remain well below the relevant criteria at surrounding privately-owned residences.

Cumulative Impacts

The EA assessed the cumulative air quality impacts of the Mangoola mine with:

- the proposed increase in production;
- background dust concentrations;
- approved (but not yet commenced) mining operations at the Mount Pleasant Coal Mine;
- the contributions from the existing operations at nearby coal mines (i.e. Bengalla and Mount Arthur); and
- the proposed western extension to the Bengalla Coal Mine.

However, Planning & Infrastructure is also currently assessing an application for a westward extension to the Mount Arthur Coal Mine. This means that there are 3 applications before Planning & Infrastructure that have the potential to increase dust emissions in the areas to the west of Muswellbrook. To ensure that Planning & Infrastructure has an accurate picture of the potential cumulative air quality impacts, it has commissioned a separate cumulative impact assessment that considers in detail the future mining at Mangoola, Bengalla and Mount Arthur (see Appendix G).

The additional cumulative assessment modelled the following:

- annual average PM₁₀;
- 24 hour PM₁₀; and
- annual average PM_{2.5}.
- **Annual Average PM₁₀** - the cumulative assessment indicates that 6 privately-owned residences would exceed the annual average PM₁₀ criteria of 30 µg/m³ in the study area (which incorporates a large area to the west of Muswellbrook). However, only 1 of these residences (Receptor 83) directly to the west of mine would exceed the annual average PM₁₀ criteria as a direct result of the emissions associated with the Mangoola mine (see Appendix G).

As mentioned above, this residence is already in the acquisition zone for Mangoola, and there would be an increase in dust concentrations at this property proportional to the increase in production (i.e. approximately 22%). The other 5 residences are located several kilometres to the east of Mangoola and exceed the applicable criteria as a result of emissions from the Bengalla and Mount Arthur Coal Mines. For example, the assessment indicates that the Mangoola mine would contribute 27 µg/m³ of the maximum predicted annual average PM₁₀ concentration of 36.8 µg/m³. In contrast, the maximum contribution to annual average PM₁₀ concentrations of Mangoola at the other 5 properties would be 1.3 µg/m³.

- **24 hour PM₁₀** – the assessment used the NSW EPA's contemporaneous approach in accordance with the *Approved Methods for Modelling and Assessment of Air Pollutants* at 11 representative locations in the study area. The assessment found that in almost every case, there would be no additional systemic exceedances (i.e. greater than 5 days a year) of the 24 hour PM₁₀ criteria of

50 $\mu\text{g}/\text{m}^3$ at the representative locations. The exception is 1 representative location near Mount Arthur where contributions from Mangoola would be negligible.

- **Annual Average & 24 hour $\text{PM}_{2.5}$** – the National Environment Protection Measure (NEPM) establishes an advisory reporting standard for annual average $\text{PM}_{2.5}$ of 8 $\mu\text{g}/\text{m}^3$ and 25 $\mu\text{g}/\text{m}^3$ for 24 hour $\text{PM}_{2.5}$. While it is acknowledged that $\text{PM}_{2.5}$ is an advisory standard (and not an assessment criteria), the cumulative assessment found that these standards would not be exceeded at any privately-owned residence in the study area.

Given the results of the cumulative impact assessment, Planning & Infrastructure is confident that the modified operations at Mangoola would not result in any *additional* exceedances of the EPA's air quality criteria at privately-owned residences when compared to the existing operations. The 1 privately-owned residence (Receptor 83) currently in the acquisition zone for significant air quality impacts would remain.

Acquisition Zone

It is important to note that there are some differences in the assessment in the EA and the cumulative air quality assessment commissioned by Planning & Infrastructure. In particular, the EA for the proposal predicted that 5 additional privately-owned residential properties would *marginally* exceed the cumulative annual average PM_{10} criteria (Receptors 182, 230, 231, 238 and 241C). These properties are located more than 4 km to the east of the mine, and the EA indicated that the predicted exceedances would primarily occur as a result of other dust sources in the area, particularly the Bengalla and Mount Arthur mines.

The subsequent cumulative air quality assessment provides revised predictions for these properties based on updated information for each of the 3 mines in the locality (i.e. Mangoola, Bengalla and Mount Arthur). The revised predictions indicate that cumulative dust concentrations at these properties would comply with the cumulative annual average PM_{10} criteria of 30 $\mu\text{g}/\text{m}^3$.

Planning & Infrastructure notes that the cumulative assessment it has commissioned provides a more accurate and consistent prediction of the likely cumulative impacts of mining in the area, and has been verified with a broad range of monitoring data from each of the mines. Consequently, Planning & Infrastructure believes that the 5 properties in question should not be entitled to acquisition as a result of cumulative dust impacts. However, as with any privately-owned residence, if subsequent monitoring demonstrates systemic exceedances of the EPA criteria, the owners of these properties would be entitled to acquisition from one or more of the operating mines in the area.

Mine-Owned Residences

As described above, Mangoola Coal currently tenants 49 houses in the areas surrounding the mine. The cumulative air quality assessment includes a revised assessment for mine-owned properties, and indicates that a significant proportion of these properties are now predicted to comply with relevant dust criteria. However, there are a number of properties in close proximity to the mine where predicted dust concentrations would significantly exceed the applicable criteria.

There is no set limit applicable to mine-owned properties, and NSW Health has raised concerns regarding air quality impacts for the tenants of these properties and whether the tenants have been consulted regarding the potential health risks. As with noise, under the project approval, Mangoola Coal is required to develop a brochure to advise landowners and or future tenants of possible health and amenity impacts of the project, including air quality. To this end, NSW Health has developed a fact sheet '*Mine Dust and You*' which describes the potential health impacts associated with elevated dust concentrations.

Mangoola Coal provides all prospective tenants with a copy of this fact sheet prior to entering into a tenancy agreement. Under the tenancy agreement, tenants can make a written request to Mangoola Coal at any time if they believe the mining related impacts are unacceptable, and if the issue cannot be resolved, the tenants can terminate their agreement without penalty. Given this, Planning & Infrastructure is satisfied that the tenants have been made aware of the potential health implications of dust generated by the mine. Nonetheless, Planning & Infrastructure has recommended a condition that clarifies the obligations of Mangoola Coal in regard to managing and monitoring air quality at mine-owned residences that is consistent with the contemporary mining approvals.

Greenhouse Gases

The EA includes a Greenhouse Gas Assessment that has been undertaken in accordance with the *National Greenhouse Accounts (NGA) Factors 2010*.

The assessment shows that proposal would result in an increase of around 28% in annual average greenhouse gas emissions compared to the current operations. However, total greenhouse emissions over the life of the project compared to the original project approval would reduce by around 12% as a result of operational efficiencies and the reduced life of the mine. In total, the project (as modified) is estimated to contribute approximately 0.023% to Australia's emissions and 0.125% to NSW's emissions.

Under the existing conditions of approval, Mangoola Coal is required to implement an Energy Savings Action Plan to minimise greenhouse gas emissions and improve energy efficiency. Given that the proposal would result in an overall reduction in greenhouse gas emissions, Planning & Infrastructure is satisfied that no additional measures are required to further reduce emissions.

Other Issues

Notwithstanding the above, Planning & Infrastructure acknowledges the concerns of the local community about the increase in dust collecting on surfaces, and the potential impact on drinking water tanks and respiratory health.

However, in the statement of commitments attached to the existing project approval, Mangoola Coal has made a commitment to address the dust deposits in rain water tanks and on solar hot water heating systems at private residential properties within 4 km of the mine. In accordance with this requirement, Mangoola Coal has been cleaning rain water tanks annually and has installed first flush systems at a number of properties to minimise any sediment in drinking water tanks. Mangoola Coal has now extended this commitment to a 6 km radius for the installation of first flush systems, and the cleaning of drinking water tanks, although it is proposing to clean the tanks once every 2 years for residences between 4 and 6 km from the mine.

Planning & Infrastructure believes this commitment is a reasonable and effective response by Mangoola Coal to address the concerns of the local community, and there is limited opportunity or justification for extending the obligations of Mangoola Coal in regard to this issue, particularly as monitoring demonstrates the mine is comfortably complying with all of the EPA dust criteria in the majority of the areas where this obligation applies.

Conclusion

The assessment indicates that the proposal would increase the total dust emissions from the site by around 22% (i.e. in line with the proposed increase in production). However, the assessment also predicts that dust emissions from the project would remain below the applicable criteria at all but one privately-owned residence (Receptor 83), which was already predicted to experience significant air quality impacts and has acquisition rights under the existing project approval.

Notwithstanding, Planning & Infrastructure acknowledges that the community has significant concerns about the dust impacts of the mine, and Mangoola Coal should be required to implement all reasonable and feasible measures to minimise these impacts.

To this end, Planning & Infrastructure has reviewed the existing management, mitigation and monitoring measures employed on the site. Based on this review, Planning & Infrastructure is satisfied that the air quality management system being implemented by Mangoola Coal is consistent with best practice, and there are limited opportunities to further reduce dust emissions from the site.

Notwithstanding, Planning & Infrastructure has recommended that the existing conditions of approval be updated to reflect contemporary standards in regard to the management, mitigation and monitoring of air quality, including the Air Quality Management Plan, the operating conditions, and the air quality impact assessment criteria.

Overall, Planning & Infrastructure is satisfied that Mangoola Coal is proposing to do everything that is reasonable and feasible to minimise dust emissions from the site, and that the air quality impacts of the modified mining operations would be acceptable.

5.4 Transport

The traffic and transport assessment was prepared by Hyder Consulting and peer reviewed by GTA Consultants. Both Planning & Infrastructure and RMS are satisfied that the transport assessment provides a sound basis to consider the traffic impacts of the proposal on the local and classified road network. The proposal would not result in a change to the maximum number of 10 trains per day and has therefore not been assessed further.

Existing Situation

The Mangoola mine is located on Wybong Road and access to the mine is via the Northern Access Road (see Figure 7). Wybong Road (east) connects to Denman Road via the Bengalla Link Road. The majority of traffic from Mangoola turns left on Denman Road and then proceeds into Muswellbrook or turns right into Thomas Mitchell Drive, which connects to the New England Highway. A limited number of vehicles would also use Denman Road or Edderton Road to access the Golden Highway to the south.

Under the project approval, vehicles associated with the Mangoola mine are not permitted to use a number of local roads including:

- Wybong Road (to the west of the mine);
- Roxburgh Road;
- Reedy Creek Road; and
- Mangoola Road.

The road authorities for the key roads in the area are as follows:

- RMS – Denman Road, Golden Highway and New England Highway; and
- Council – Wybong Road, Bengalla Link Road, Edderton Road and Thomas Mitchell Drive.

There are a number of coal mining operations that are located close to Mangoola mine, including Bengalla, Mount Arthur and Drayton. All these mines generate traffic on the local road network to the west of Muswellbrook, and have been considered in the assessment of the current proposal.

Traffic Generation

The proposal would result in an increase from 300 to 540 employees on site. Assuming 1 person per vehicle, the assessment calculated that this would increase light vehicles from 133 to 272 in the morning peak and 135 to 274 in the evening peak (i.e. an increase of 278 light vehicles a day). This represents approximately 45% of the daily traffic movements on Wybong Road.

Heavy vehicle deliveries would increase from 82 to 107 per day, although this would primarily be outside the peak times. This represents approximately 85% of the daily heavy vehicle movements on Wybong Road.

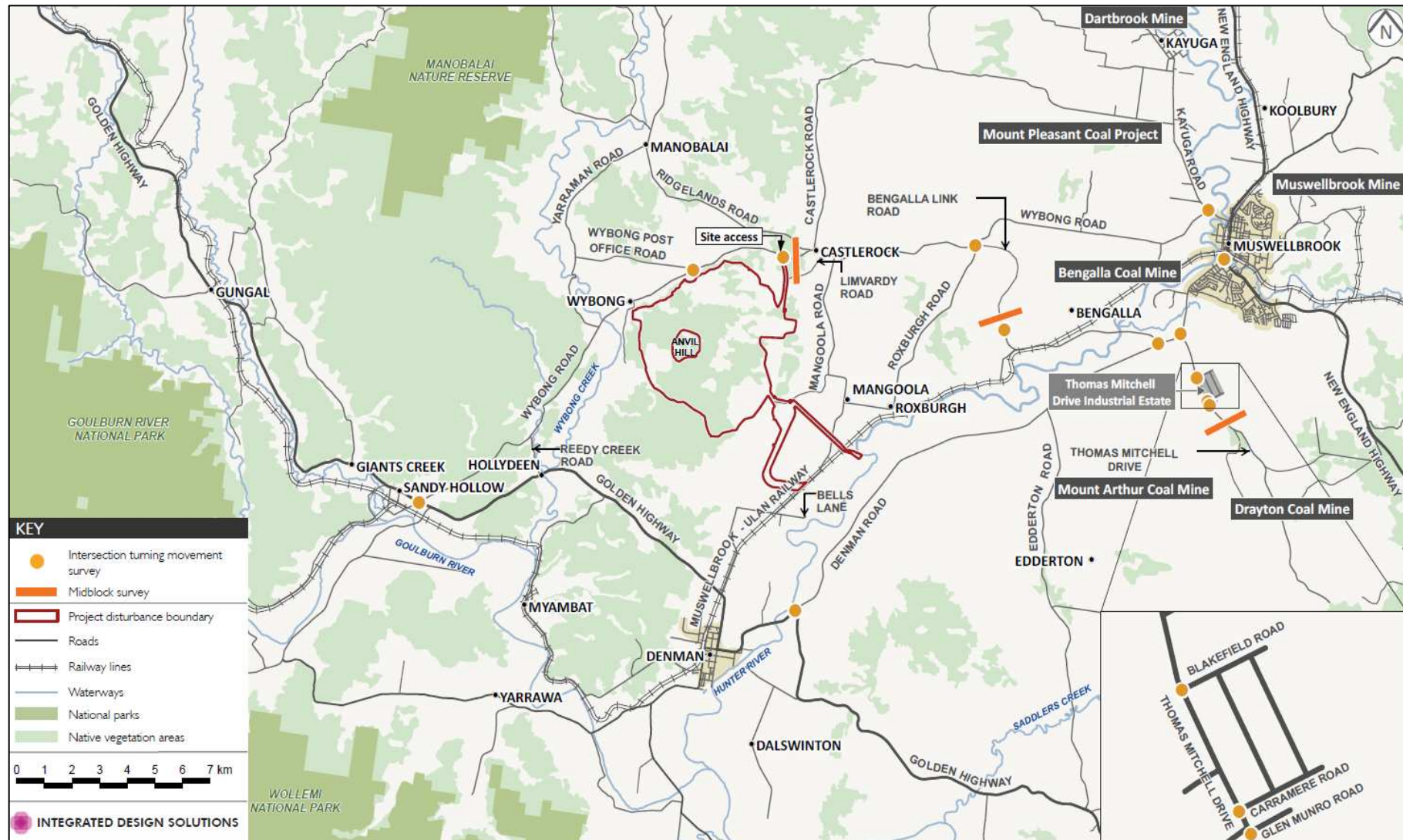
Road Capacity

To determine the impact of the increased traffic volumes, the mid-block performance was assessed for Wybong Road, Bengalla Link Road and Thomas Mitchell Drive. The assessment also took into consideration the cumulative impacts of surrounding mines and other traffic generating industries. The results indicate that the additional traffic would be absorbed by the existing roads without significantly affecting road performance. The mid-block traffic performance results indicated that only 65% of the available capacity would be used under the worst case scenario. The assessment identified that the intersections, rather than mid-blocks are the more critical factor affecting the overall performance of the local road network.

Intersection Performance

The four key intersections associated with traffic from the Mangoola Coal Mine are (see Figure 7):

- Wybong Road/Northern Access Road;
- Denman Road/Bengalla Link Road;
- Denman Road/Thomas Mitchell Drive; and
- New England Highway/Thomas Mitchell Drive.



Intersection performance was assessed using the SIDRA software to determine the level of service (LoS) with the increased traffic volumes using 3 scenarios – project with modification, project without modification, and cumulative impact scenario. However, the most relevant scenario is the worst case cumulative impacts scenario that modelled intersection performance in 2017 when the workforce at the Mangoola mine would be at its greatest. Table 3 compares the project without modification and cumulative impact scenarios.

The results show that Denman Road/Bengalla Link Road and New England Highway/Thomas Mitchell Drive would both continue to operate at a satisfactory LoS when the cumulative traffic generation is considered. However, by 2017, the Denman Road/Thomas Mitchell Drive intersection would deteriorate to an unacceptable level of service (i.e. LoS F).

Table 3: SIDRA Intersection Analysis - 2017

Intersection	DoS		Average delay (s)		LoS		Queue length (m)	
	Do-nothing	Worst Case	Do-nothing	Worst Case	Do-nothing	Worst Case	Do-nothing	Worst Case
Denman Road/Bengalla Link Road	0.766	0.847	13.65	15.3	B	B	71.6	101.3
New England Highway/Thomas Mitchell Drive	0.426	0.435	11.8	8.6	B	B	20.2	20.9
Denman Road/Thomas Mitchell Drive (existing configuration)	1.305	-	63.1	-	F	-	386	-
Denman Road/Thomas Mitchell Drive (upgraded configuration)	0.409	0.422	11.2	11.3	B	B	16.4	16.9

Road Upgrade and Maintenance Contributions

Planning & Infrastructure has considered whether Mangoola Coal should be required to make additional contributions to Council for the upgrading and maintenance of local roads as a result of the increased traffic from the mine. In this regard, the key roads would be Wybong Road (east), Bengalla Link Road, and Thomas Mitchell Drive. Other roads in the area have not been considered in detail because they are not expected to experience any significant increase in traffic from the mine and/or are classified roads managed by RMS.

Under the existing approval and the associated Voluntary Planning Agreement (VPA), Mangoola Coal has a range of obligations in regard to the upgrade and maintenance of the local road network. These obligations (and whether they have been completed or not) are summarised in Table 4.

Table 4: Road Upgrade and Maintenance Requirements

Project Approval Requirements	Status	Cost (Approximate)
Upgrade Works		
Mine Access Rd/Wybong Rd Intersection	Completed	\$1.1 million
Golden Highway/Wybong Rd Intersection	Completed	\$ 140,000
Bengalla Link Rd/Wybong Rd Intersection	Completed	
Bengalla Link Rd/Denman Rd Intersection	Completed	
Wybong Rd Upgrade	Completed	\$ 8.2 million
Wybong Rd Rectification Works	Completed	\$ 1.7 million
Wybong Rd Maintenance	Completed	\$ 800,000
Safety and signage works	Completed	\$ 3 million
TOTAL (to date)		\$17.3 million
Wybong Rd Rectification Works (residual)	Not complete	~ \$3.5 million
TOTAL (future)		~ \$ 20.8 million
VPA Maintenance Commitments		
Wybong Rd Maintenance	Life of Project	\$ 55,000 per year + CPI
General Mine Affected Roads Maintenance	Life of Project	\$ 220,000 per year + CPI
TOTAL		\$275,000 a year + CPI

As can be seen from Table 4, Mangoola Coal has already undertaken more than \$17 million of road upgrades, and has a continuing liability under its VPA with Council to contribute \$275,000 a year towards the maintenance of Wybong Rd and the local road network.

However, the quantity of the existing obligations is not necessarily the key matter for consideration in the assessment of the proposal. Rather, it is whether any further upgrades or maintenance contributions are required to accommodate the additional traffic generated by the proposal.

In this regard, Planning & Infrastructure notes that the mid-block and intersection performance for all local roads and associated intersections is predicted to remain at acceptable levels with the additional traffic generated by the Mangoola mine, with the exception of the intersection of Thomas Mitchell Drive with Denman Road (as mentioned above).

Planning & Infrastructure also notes that in August 2013, Council accepted Mangoola Coal's revised VPA offer which does not commit to any additional road maintenance funding over and above the existing annual contribution of \$275,000. Council also indicated in its submission that it was generally satisfied that the existing conditions were adequate to address the impacts on the Wybong Road.

Given these considerations, Planning & Infrastructure is satisfied that additional road upgrade and/or maintenance contributions for Wybong and Bengalla Link Roads are not warranted for this proposal.

Planning & Infrastructure's approach to developing an appropriate contributions framework for the upgrade and maintenance Thomas Mitchell Drive is discussed in detail below.

Thomas Mitchell Drive

In late 2013, Muswellbrook Shire Council commenced a major upgrade of Thomas Mitchell Drive. This upgrade is likely to cost around \$16 million, and is likely to be implemented in two stages. The first stage focuses on the eastern section of the road between the New England Highway and the entrance to the Mount Arthur mine, and is likely to cost around \$8 million. In recognition of the strategic importance of the road in supporting the mining industry, the NSW Government has agreed to contribute \$4.6 million to the upgrade of the road under the 'Resources for Regions' initiative. This would assist Council to fund its share of the upgrade costs for the road.

However, there remains a significant shortfall in the funding arrangements for the road upgrade, and both Planning & Infrastructure and Council believe that it is appropriate for a significant proportion of the upgrade (and ongoing maintenance) to be funded by the various mining companies which rely on the road for their operations (i.e. Mangoola, Bengalla, Mount Arthur and Drayton).

To provide a sound technical basis for the funding responsibilities for the upgrade, Planning & Infrastructure has commissioned GHD to undertake an independent Contributions Study. This study also includes the Denman Road/Thomas Mitchell Drive intersection, and establishes a framework for funding the ongoing maintenance of the road over its 30 year design life.

The draft study indicates that of the 4 mines, Mangoola contributes the lowest volume of traffic to Thomas Mitchell Drive (2.7% of total traffic) and the second lowest volume of traffic to the intersection with Denman Road (7.3% of total traffic). The GHD study is currently being finalised in consultation with Council and the mining companies, and consequently, it is not possible to impose a specific monetary obligation on Mangoola at this stage. However, Planning & Infrastructure has recommended a condition that requires Mangoola to contribute funding as directed by the Director-General based on the final outcomes of the GHD Study once this is complete.

In regard to the Denman Road/Thomas Mitchell Drive intersection, there is an existing obligation for Mount Arthur Coal to upgrade the intersection by December 2019 (unless otherwise agreed to by the relevant road authority). In this case, the relevant road authority is the RMS (as Denman Road is a classified road), and in its submission on the Mangoola modification it recommended that the upgrade of the intersection be brought forward to ensure it continues to provide a satisfactory level of service and safety for all road users.

However, the traffic assessment indicates that even in the absence of the additional traffic from the Mangoola mine, the upgrade of the intersection would need to be brought forward due to growth in background traffic and increases in traffic from other mining operations.

Consequently, in Planning & Infrastructure's view, the cost of bringing forward the intersection upgrade should remain the primary responsibility of Mount Arthur Coal, but Mangoola Coal and the other mines in the area should also be required to contribute in accordance with the contributions framework to be established under the GHD study.

Finally, it is important to note that any contributions required under the GHD study would need to take into account the existing contributions Mangoola makes to road works and maintenance in the Muswellbrook Shire under its existing project approval and the Voluntary Planning Agreement it has with Council.

Conclusion

The assessment indicates that Mangoola is a significant contributor to traffic volumes on local roads (particularly Wybong Road), and that the proposed modification would increase both light and heavy vehicle traffic generated by the mine. However, Planning & Infrastructure is generally satisfied that even with the increase in traffic the local road network would continue to perform satisfactorily. The exception is Thomas Mitchell Drive and its intersection with Denman Road.

This issue has been recognised by Planning & Infrastructure, Council and the various mining companies involved, and Mangoola would be required to contribute to the upgrading and maintenance of this infrastructure in accordance with the outcomes of the GHD Contributions Study once this is finalised. Provided that these upgrade works are completed by 2017, Planning & Infrastructure is satisfied that the increase in traffic associated with the proposal could be accommodated by the local and regional road network without any significant impact on the safety and convenience of other road users.

5.5 Surface Water

Introduction

The existing site water management system is managed in three separate zones:

- *dirty water zone* – manages runoff (dirty water) from areas disturbed by mining, including overburden emplacement areas and rehabilitated areas;
- *saline water zone* – contains water that has been in contact with the coal measures, and cannot be discharged from the site under the existing project approval and EPL; and
- *raw water zone* – water extracted from the Hunter River and captured from areas that have not been disturbed by mining.

The proposal would result in changes to the overall water balance and surface water management system for the approved project, including:

- allowing saline water to be discharged to the Hunter River under the *Hunter River Salinity Trading Scheme* (HRSTS);
- higher demand for process water at the CHPP, albeit that the total volume over the mine life would not increase; and
- increased risk of water shortages during periods of low rainfall.

Saline Discharges

Mangoola Coal has identified that during periods of high rainfall there may be insufficient capacity in the existing water management system to capture and store all saline water, particularly when operating at the maximum capacity of 13.5 Mtpa. This is because the area that is reporting to the surface water management system would increase by about 274 ha.

Mangoola Coal has investigated a number of options for increasing the capacity of the surface water management system, including the construction of an additional water storage dam either on site or outside the project boundary. However, both options were discarded because the on-site storage would sterilise significant volumes of coal, and the off-site storage would result in additional disturbance within the biodiversity offset areas.

Consequently, unless Mangoola Coal is able to discharge saline water to the Hunter River, it would be required to use the tailings dam and active mining pits to store excess saline water. This would significantly disrupt mining operations and result in a consequential reduction in production. Given this, Mangoola Coal is seeking approval to discharge saline water into the Hunter River (via its existing extraction pipeline) under the HRSTS, and has undertaken modelling to assess the likelihood and volume of any discharges under two different operational scenarios.

The modelling was undertaken by WRM Water and Environment and peer reviewed by Gilbert and Associates, and considered the following scenarios at various stages in the mine life:

- *Scenario 1 – high water demand*: based on maximum 13.5 Mtpa of ROM coal washed through the CHPP; and
- *Scenario 2 – low water demand*: assumes 8 Mtpa of ROM coal washed through the CHPP and the remaining 5.5 Mtpa bypassing the CHPP (i.e. unwashed).

Based on the worst case scenario (in this case Year 10), it is predicted that there would be up to 19 days of controlled discharges to the Hunter River each year (see Table 5). The maximum predicted annual discharge is 1,209 ML, with a discharge rate of up to 50 ML/day.

Table 5: Controlled Discharges under the HRSTS

Mine Plan	Scenario 1 – High Water Demand		Scenario 2 – Low Water Demand	
	Annual average discharge days ¹	Maximum volume of discharge event (ML)	Annual average discharge days ¹	Maximum volume of discharge event (ML)
Year 10	6.1	746	19	1,209

¹ Over 114 year historical simulation period

Hunter River Salinity Trading Scheme

The HRSTS is a cap and trade market mechanism established by the NSW Government in 2002, and is administered by the EPA. The Scheme is designed to provide flexibility to mining companies and other industries in discharging saline water into the Hunter River during high flow conditions, while ensuring that the total salt load does not exceed the cap imposed by the EPA. In the case of the upper segments of the Hunter River, the salinity is capped at 600µS/cm.

As mentioned above, Mangoola Coal is proposing to discharge the saline water from the site in accordance with the HRSTS. Currently, Mangoola Coal holds 20 of the 1,000 available credits under the Scheme. At this stage, it is not possible to determine whether 20 credits would be sufficient for Mangoola Coal as the volume allowed to be discharged depends on the salt concentrations in the discharge water. However, the scheme allows trading of credits between licence holders, which would enable Mangoola Coal to increase or decrease the number of credits it holds, and adjust its saline discharges accordingly. In the event that Mangoola Coal is unable to secure sufficient credits under the HRSTS, it would need to retain saline water on the site, and pump any excess saline water into the tailings dam and/or the active mining areas. While this situation is both undesirable and unlikely, it provides a robust safeguard against any uncontrolled discharge of saline water from the site.

Muswellbrook Shire Council has objected to the proposal to discharge saline water into the Hunter River, and a number of public submissions have also raised concerns about the impacts on surrounding agricultural land uses, particularly the thoroughbred industry. However, Planning & Infrastructure notes that the HRSTS was established to ensure that the salinity concentrations in the Hunter River are appropriately controlled to allow agriculture, mining and electricity generation to operate side by side.

In this case, Planning & Infrastructure is satisfied that there is a clear operational and economic justification for the proposed saline discharges from the mine, and given that any discharges would be tightly controlled through the HRSTS, Planning & Infrastructure believes that the impacts of the proposed discharge would not increase the cumulative impacts of mining on water quality in the Hunter River. Importantly, the EPA, which regulates the HRSTS, has raised no objections to Mangoola Coal's proposal to participate in the Scheme. However, the EPA recommended monitoring be undertaken both upstream and downstream of the discharge point, and a Saline Dispersion Study be undertaken during the first discharge under the HRSTS.

Mangoola Coal has committed to monitoring water quality in the Hunter River including real-time monitoring of the discharge rate and salinity levels both upstream and downstream of the discharge point, and Planning & Infrastructure has recommended a condition that requires Mangoola Coal to undertake a Saline Dispersion Study to the satisfaction of the EPA.

Planning & Infrastructure notes that there are 7 surface water extraction licences within 2 km of the proposed discharge point, and Mangoola Coal has committed to notify all downstream landowners within 1 km of the discharge point when it plans to discharge to the Hunter River. However, Planning &

Infrastructure has recommended a condition that requires Mangoola Coal to notify all 7 landowners that have extraction licences about proposed discharges.

Planning & Infrastructure also notes that Fisheries NSW raised concerns about the potential impacts on fish stocks and aquatic habitat in the Hunter River, and recommended that a suitable monitoring program be implemented to determine any significant impacts on the aquatic biota associated with the saline discharges. However, Planning & Infrastructure considers that a separate monitoring program and impact assessment for aquatic biota is not warranted in this case as any impacts have been considered in the cap imposed on total salt loads in the Hunter River under the HRSTS. Planning & Infrastructure also notes that the real-time monitoring proposed by Mangoola Coal would be made publicly available through the various environmental reporting obligations under the existing project approval, and Fisheries NSW would be able to obtain this information as required.

Water Supply

Currently, water is obtained from 3 key sources, namely:

- surface water captured in the water management system on the site;
- groundwater seepage into the open cut pits; and
- water abstracted from the Hunter River under general and high security water access licences held by Mangoola Coal under the *Water Sharing Plan for the Hunter Regulated River*.

The proposed increase in production would increase the average water demand on the site by about 26% (i.e. 2,040 ML up to 2,580 ML a year) primarily as a result of the additional water required for washing coal at the CHPP and dust suppression on haul roads. The additional make-up water would be sourced primarily from the Hunter River. Currently, Mangoola Coal can draw up to 2,791 ML/yr if the available water determination for the Hunter River is at 100%. This is more than sufficient to maintain full production at the mine. However, the assessment indicates that during periods of prolonged low rainfall, combined with a significant reduction in the available water determination from the Hunter River, there would be a significant shortfall in the raw water supply required to operate the mine at maximum capacity.

To address this risk, Mangoola Coal has committed to undertaking an annual review of the site water balance to determine if there would be a potential water supply shortfall within a two year planning horizon based on worst case rainfall predictions. If the review predicts that there would be an unacceptable operational risk within that period, Mangoola Coal would consider and implement a number of contingency measures including:

- reducing water demand across the site by scaling back production;
- extracting groundwater using its existing groundwater licences; and
- investigating alternative water saving measures and water supply opportunities.

Planning & Infrastructure notes that the existing prohibition on using licensable water from the Wybong Creek Water Source in the conditions would remain.

In considering this issue, Planning & Infrastructure notes that:

- the assessment indicates that under average rainfall conditions Mangoola Coal would have sufficient water to operate at maximum capacity;
- the potential shortfall in water supply is not a new issue, and Mangoola Coal has been managing its operations to match the available water supply since operations commenced in 2010;
- the additional water demand associated with the proposal is not substantially greater than is currently the case;
- there is over 4,000 ML of surface water storage capacity on the site, which provides a significant buffer for Mangoola Coal to plan and implement contingency measures to obtain additional water for its operations if required; and
- ultimately, this is a commercial risk for Mangoola Coal to manage, as the existing conditions of approval require that production be adjusted to match the available water supply.

Given these considerations, Planning & Infrastructure is satisfied that Mangoola Coal is likely to have sufficient water to operate at the proposed maximum production of 13.5 Mtpa for the vast majority of the project life, and any shortfall can be adequately managed by scaling back production and/or implementing a range of contingency measures.

Conclusion

The issues with the water management arrangements at the Mangoola mine during prolonged periods of either above average or below average rainfall were flagged in the original assessment for the

project. Planning & Infrastructure considers the proposed approach outlined in the current modification to managing this issue is reasonable, and is unlikely to result in any significant impacts on surface water resources.

Nonetheless, to ensure water resources are effectively managed, Planning & Infrastructure has recommended a number of conditions requiring Mangoola Coal to:

- ensure that all saline water discharges to the Hunter River are in accordance with the HRSTS and comply with the EPL for the site;
- notify all downstream water users within a 2 km of the discharge point when discharges to the Hunter River are scheduled;
- ensure that it has sufficient water for all stages of the project including an annual site water balance review, and if necessary adjust the scale of mining operations on site to match its available water supply; and
- update the existing Surface Water Management Plan to reflect the proposed changes to the surface water management system at the mine.

5.6 Rehabilitation and Final Landform

The key changes to rehabilitation and the approved final landform include:

- faster rate of progressive rehabilitation commensurate with the proposed increase in production rate;
- an increase in the area of overburden emplacement area at the maximum height of 240 m RL, although there would be no increase in the maximum approved height.
- minor realignment and rescheduling of the approved Anvil Creek and Clarks Gully diversions; and
- shaping and introduction of micro-relief on the overburden emplacement areas.

No changes are proposed to the size of the final void or the maximum approved overburden emplacement height.

In general, Planning & Infrastructure supports the proposed changes to progressive rehabilitation and introduction of micro-relief in the final landform, as it would minimise the areas liable to generate fugitive dust emissions and result in a more natural landscape in the long term. These changes are also generally consistent with best practice for open cut mines in NSW, and Muswellbrook Council's *Mining Rehabilitation Policy*. Planning & Infrastructure is also satisfied that the changes to the alignment and scheduling of the Anvil Creek and Clarks Gully diversions are generally consistent with the approved mine plan, and would not result in any additional impacts.

However, it can be seen from Figure 8 that the changes proposed to the main overburden emplacement area in the northern section of the mine are reasonably significant. In particular, Planning & Infrastructure notes that the overburden emplacement area would extend further to the southwest, and there would be a significantly greater area of the emplacement area at the maximum height compared with the current approval (117 ha compared with 59 ha).

The proposed increase in the area of the emplacement area at the maximum height (i.e. RL 240m) would be required to facilitate the proposed increase in production, particularly the provision of additional dumping volumes early in the production schedule. Importantly, the altered shape of the overburden emplacement areas would also allow more scope for a natural final landform and drainage lines to be created through the application of the 'geofluv' landform design process that is currently being trialled on site. It is also important to note that Mangoola is not proposing any changes to the slopes of the overburden emplacements which would generally remain at 10 degrees. However, instead of a long continuous slope at the edge of the overburden emplacement area, there would be a stepped profile to the overburden emplacement area (see Figure 9).

A number of submissions raised concerns relating to the final void and associated water quality impacts. However, there is no proposal to change the size, location or function of the final void. The final void would be designed to be self-contained and isolated from the surrounding environment to prevent saline water flowing into the surrounding aquifers. The only change is associated with the increased mine production which would result in the final void being created earlier than would otherwise be the case.

Conclusion

Planning & Infrastructure believes that the proposed changes to the rehabilitation and final landform would not appreciably alter the impacts of the approved development, and would provide an

opportunity to create a more natural final landscape with the associated environmental, visual and long term land use benefits that such a landform delivers.

Notwithstanding, Planning & Infrastructure acknowledges that the proposed changes may marginally increase visual impacts, including lighting impacts with increased dumping at the maximum height of RL 240m. The potential visual impacts and associated mitigation measures proposed by Mangoola to address this issue are discussed in more detail in the next section.

In terms of the conditions, Planning & Infrastructure has recommended that the rehabilitation objectives and management arrangements in the existing consent be updated to reflect contemporary standards.

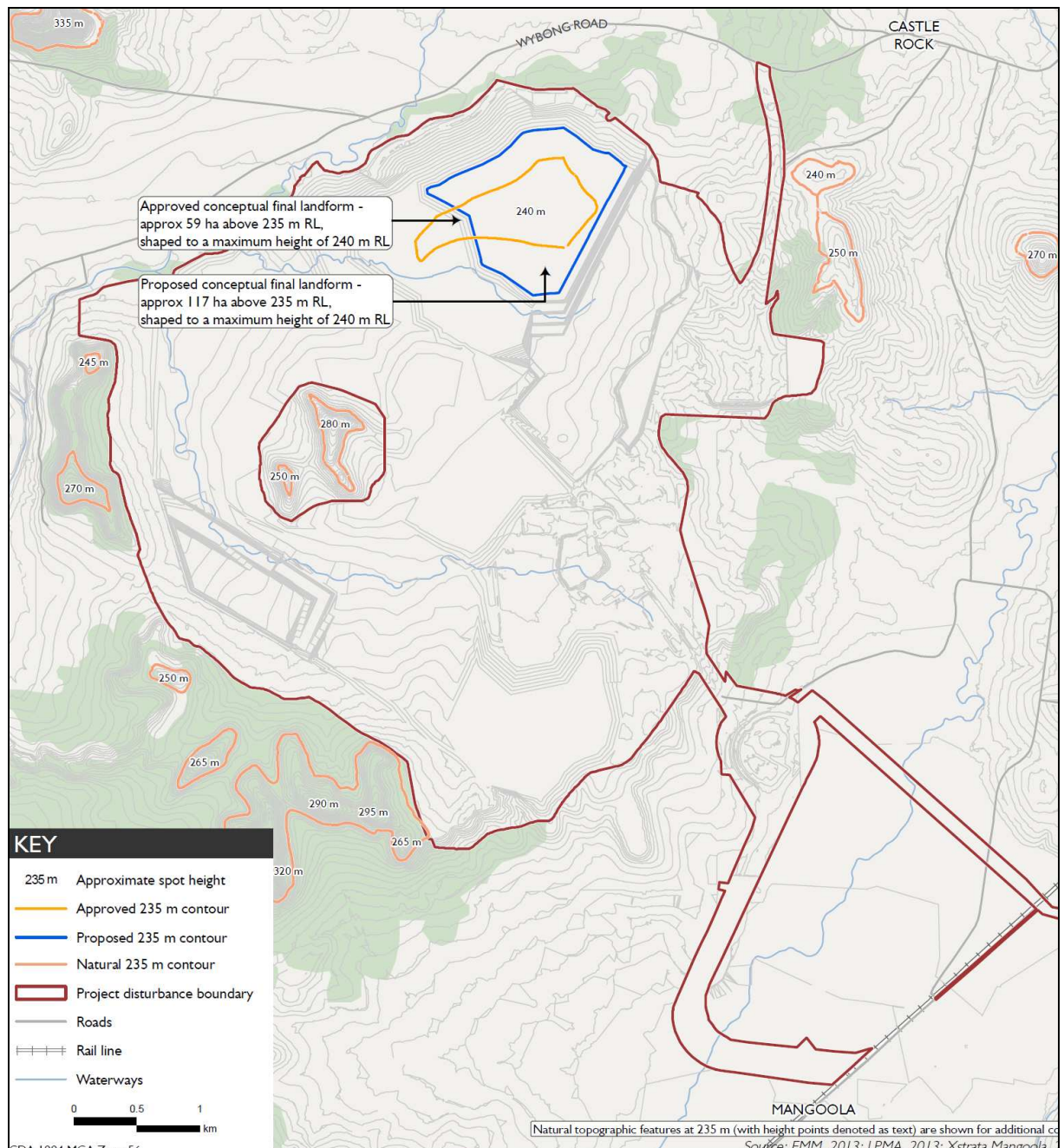


Figure 8: Comparison of maximum height (240m) of existing and proposed final landform

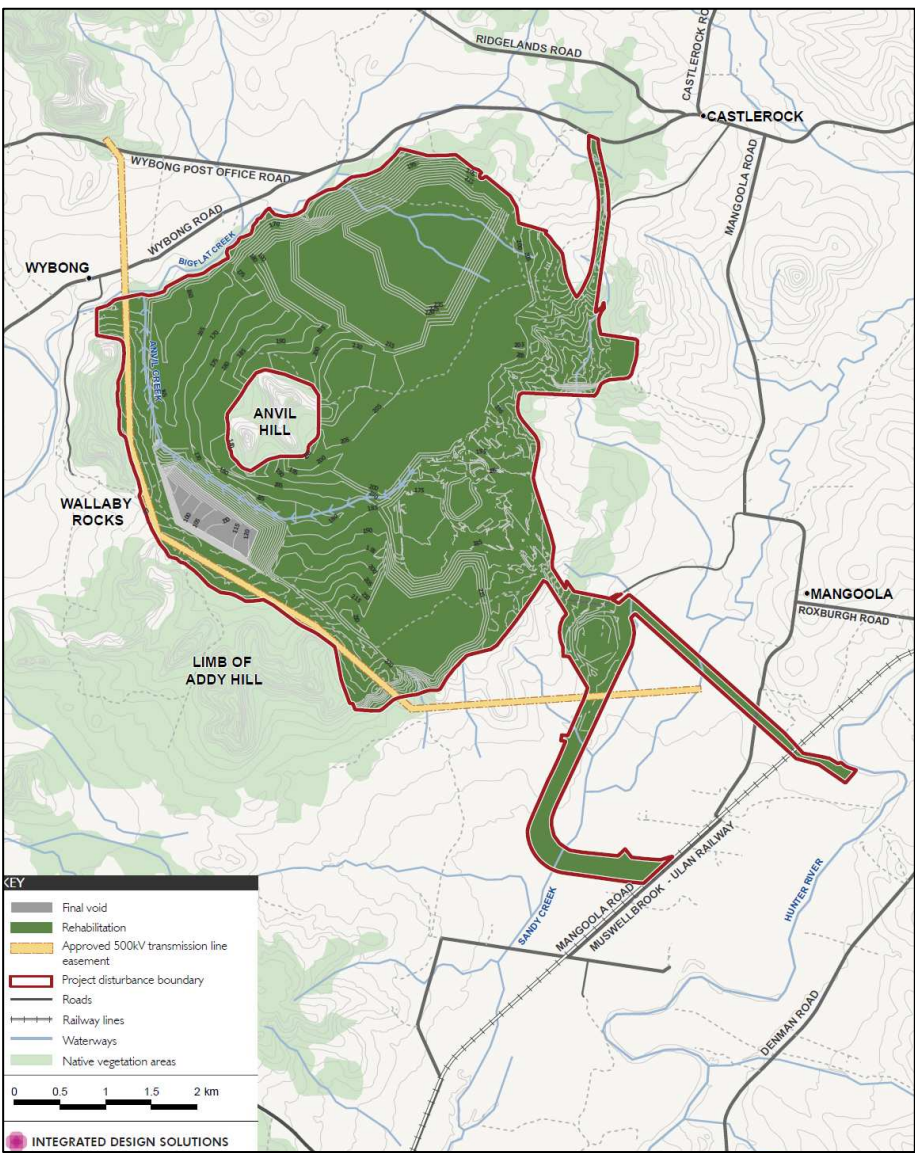
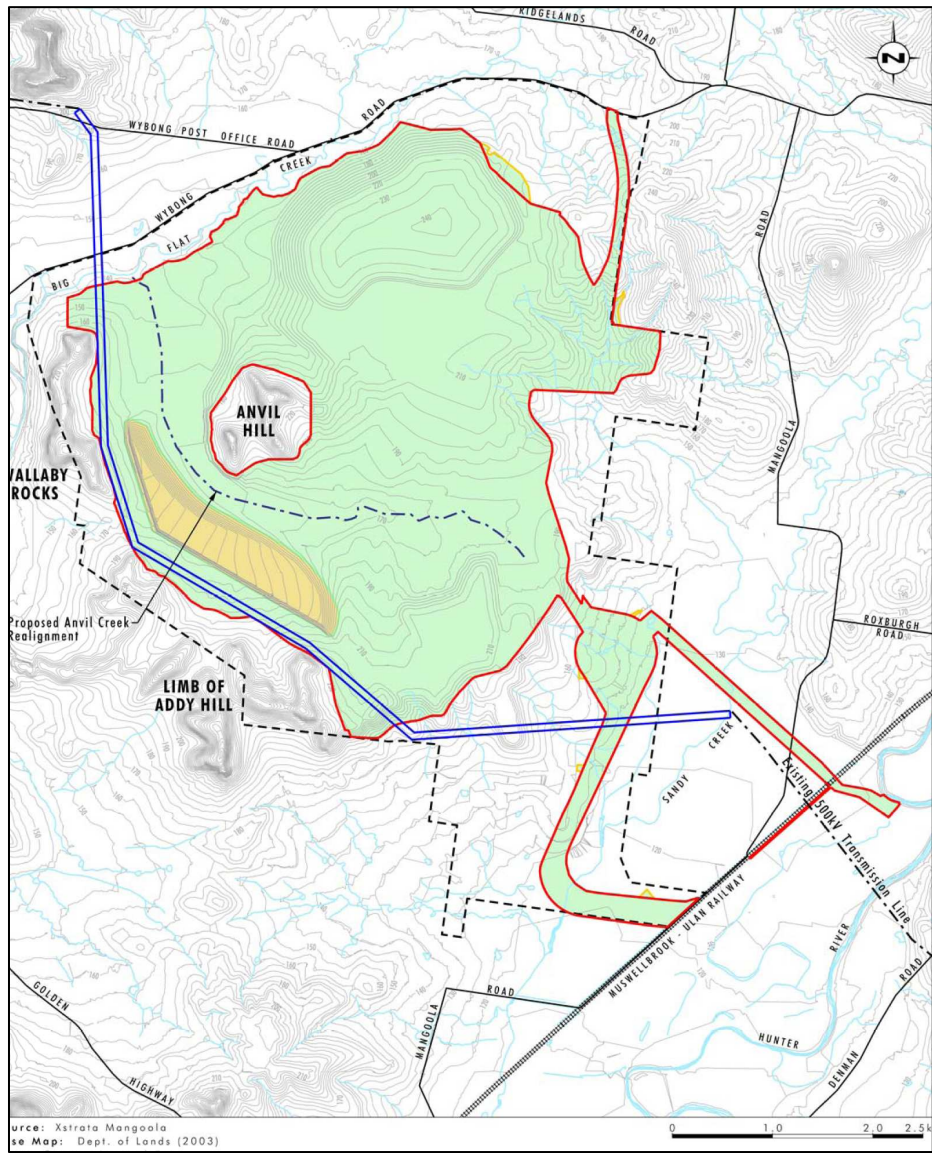


Figure 9: Comparison of existing and proposed final landforms

5.7 Visual

A Visual and Lighting Assessment was undertaken by EMM and compared previously assessed viewpoints to determine if there would be any additional visual impacts as a result of the proposal.

Under the existing operations, the dominant visual features from surrounding properties are the active mining areas, overburden emplacements and site infrastructure (such as the CHPP, water storage and rail infrastructure). At night, the dominant visible elements are lighting associated with site infrastructure and vehicles/mobile plant travelling on haul roads.

The proposal has the potential to marginally increase visual impacts as a result of:

- additional plant and equipment operating on the site at night (i.e. lighting impacts); and
- an increase in the area of overburden emplacement area at the maximum height of 240 m RL, although there would be no increase in the maximum approved height.

Planning & Infrastructure notes that the existing conditions and associated statement of commitments include a number of measures to minimise the visual impacts of the mine. These include:

- implementation of additional visual mitigation (e.g. vegetation screens) at residences that are likely to experience significant visual impacts;
- limiting emplacement of overburden to lower areas at night to reduce both noise and lighting impacts.
- minimising visual impacts of the project, including all practicable measures to mitigate off-site lighting impacts in accordance with applicable Australian Standards.

With these measures in place, the assessment indicates that there would be no significant changes to the visibility of the mine from the 12 viewpoints around the mine. The assessment also argues that in some cases the visual impacts may be reduced as a result of a shorter mine life (i.e. 12 years remaining instead of 15 years).

However, Planning & Infrastructure does not necessarily agree that a shorter mine life reduces the visual impacts of the mine, particularly as there would be an increase in the size and visibility of the overburden emplacement areas and an increase in the activity of the mining fleet on the site both during the day and night. Given this, Planning & Infrastructure considers that the increase in visual impacts is likely to be somewhat greater than Mangoola Coal suggests in its assessment, although Planning & Infrastructure acknowledges that these changes are not so significant that additional residences would experience significant visual impacts. In other words, the changes are likely to increase the impacts on residences that already experience visual impacts.

Planning & Infrastructure understands that Mangoola Coal has implemented additional visual mitigation measures at 6 of the 34 residences which were identified as being significantly affected by visual impacts, and which have not since been acquired by Mangoola Coal. Under the proposed modification, there would be no change to the additional visual mitigation conditions, and consequently, the remaining 28 landowners can request Mangoola Coal to implement the additional visual mitigation as any time. Given this, Planning & Infrastructure is satisfied that the existing conditions provide an appropriate level of additional visual mitigation for these residences, and there is no need to strengthen the conditions in this regard.

Planning & Infrastructure also notes that a number of submissions were particularly concerned about lighting associated with the operation of equipment on the overburden emplacement areas at night. As mentioned above, Mangoola Coal already has committed to restricting night-time dumping on elevated parts of the overburden emplacement areas to reduce lighting impacts. This obligation would continue to apply irrespective of the production rate at the mine, and provided this commitment is adhered to, Planning & Infrastructure is satisfied that any additional night-time lighting impacts would not be significant.

Overall, Planning & Infrastructure considers that the changes proposed under the proposed modification would result in a relatively minor increase in the visual impacts of the mine. While Planning & Infrastructure considers that the suite of mitigation measures required under the existing project approval are sufficient to ensure that any additional impacts would be adequately minimised or mitigated, it has taken the opportunity to update the conditions relating to lighting to reflect contemporary standards.

5.8 Social & Economic

The EA includes a social impact assessment and an economic assessment that identifies, assesses and analyses the social and economic costs and benefits of the proposed modification.

The key impact of the proposed modification would be the increase of 240 employees at the mine, and the associated increase in demand for community services and infrastructure in the area. A number of submissions raised concerns about these social impacts, particularly housing shortages and affordability, access to specialist health services and capacity of child-care centres.

Mangoola Coal has committed to facilitating discussions and participating in working groups with key stakeholders (including Council) to investigate options for addressing access to community services. It has also entered into a Voluntary Planning Agreement (VPA) with Council in accordance with Condition 12 of Schedule 2 of the project approval. The terms of this agreement focus primarily on the maintenance and provision of infrastructure and facilities (see Table 6).

Table 6: Summary of Contributions in VPA

Contribution Type	Detail	Amount
Road Maintenance	Wybong Road maintenance	\$55,000 per year
	General mine affect road maintenance	\$220,000 per year
Environmental Management	Local environmental management - Wybong Uplands Land Management Strategy	\$500,000
	Local environmental management	\$20,000/ per year
Local Employment	Education and Training Strategy	\$600,000
	Best endeavours to engage 6 apprentices per year sourced from residents within Muswellbrook and Aberdeen	-
Community Projects	Recreational Assets Renewal Fund	\$1,200,000
	Additional environmental and community projects	\$235,000 per year
Community Infrastructure	Denman recreational area enhancements	\$2,200,000

Mangoola Coal has also offered an additional \$100,000 a year to fund environmental and community projects, taking the total for this aspect of the VPA to \$335,000 a year. Council endorsed the terms of this revised offer in August 2013.

In addition to the VPA, Mangoola Coal has also undertaken substantial road works on Wybong Roads in accordance with its project approval requirements. To date, the cost of these road works amount to more than \$17 million, with an additional \$3 to 4 million to be spent on additional upgrade works in the near future.

Overall, Planning & Infrastructure is satisfied with the terms of the revised VPA, and believes it is would adequately compensate for the additional demand the proposed modification would create on local infrastructure.

In regard to community services, Planning & Infrastructure supports the initiatives proposed by Mangoola Coal, but notes the primary responsibility for the provision of key community services resides with the State Government. The extent to which Council is responsible for these matters, Planning & Infrastructure is satisfied that it would be adequately provided for through the rates that any additional employees that choose to reside in Muswellbrook Shire (or nearby LGAs) would be required to pay, along with Section 94 contributions for any new residential development.

Finally, Planning & Infrastructure believes the assessment of these matters should not solely focus on the demand that the additional employees may create. Considerable weight should also be given to the social and economic benefits that flow from having more people residing in Muswellbrook and surrounds. In this regard, it can reasonably be expected that the additional employees working at the Mangoola mine would become engaged members of the local community that support local businesses and participate in community activities.

5.9 Biodiversity

The proposal would not increase the approved disturbance boundary and would not result in any changes to the previously assessed biodiversity impacts.

However, while not part of the EA, Mangoola Coal has modified its application seeking to revise the offset areas identified in the Project Approval. Schedule 3, Condition 38 specifies the minimum areas required to be protected and Appendix 6 identifies the location of these areas.

To date, Mangoola Coal has been unable to acquire two of the properties identified in Appendix 6 for the offset and corridor areas (Receptors 66 and 83). To address this matter, Mangoola Coal is now proposing alternative offset areas that would exclude these two properties and include alternative areas to replace these areas.

The Statement of Commitments identified that if Mangoola Coal was unable to successfully acquire the properties identified in Appendix 6, then they would consult with Planning & Infrastructure. Planning & Infrastructure accepts the reasons for amending the offset area.

The total area of offsets would remain the same however the composition of the offset areas would change (refer Table 7). The existing treed areas would increase by 46 ha and the areas of treed areas to be established would decrease by 46 ha. Figure 10 shows the proposed offset areas.

Table 7: Proposed offset areas

Area	Project Approval requirements	Proposed offset
Existing vegetated (treed) areas	1,540 ha	1,586 ha
Treed areas to be established	1,150 ha	1,104 ha
Grassland areas	330 ha	330 ha
Total	3,020 ha	3,020 ha

The new proposed offset areas to the north of the mine are located adjacent to the areas previously proposed to be included. The areas would therefore remain as habitat corridors, albeit somewhat narrower than before. However, it is also important to consider that the existing vegetation on the properties to be excised from the offset strategy would be unlikely to be cleared, and consequently, from an ecological perspective, the habitat corridors would remain largely intact. Furthermore, the proposed offset areas are adjacent to Crown land to the north and would fulfil the objectives of the original offset areas.

It is acknowledged that there would be some variation in the vegetation communities compared to the existing offsets, but Planning & Infrastructure is satisfied that the vegetation is broadly comparable to the existing offsets and of very good quality (see Table 8). Overall, the total required offset area would be achieved, and Mangoola Coal has proposed to undertake more planting in the grassland areas to compliment surrounding vegetation types such as ironbark.

Table 8: Vegetation communities

Vegetation type	Existing offset (ha)	Proposed offset (ha)
Forest Redgum Riparian Woodland	94.26	113.12
Ironbark Woodland Complex	31.89	4.17
Rough-barked Apple Woodland	4.84	0.89
Spotted Grey Gum Open Forest	56.48	60.39
Sheltered Grey Gum Woodland	0.01	0
Paperbark Woodland	0.16	0
Currawang Tall Woodland	0	3.84
Tall Mixed Shrubland Complex	0	7.22
Derived Grassland	91.57	144.86
Total	279.20	334.50

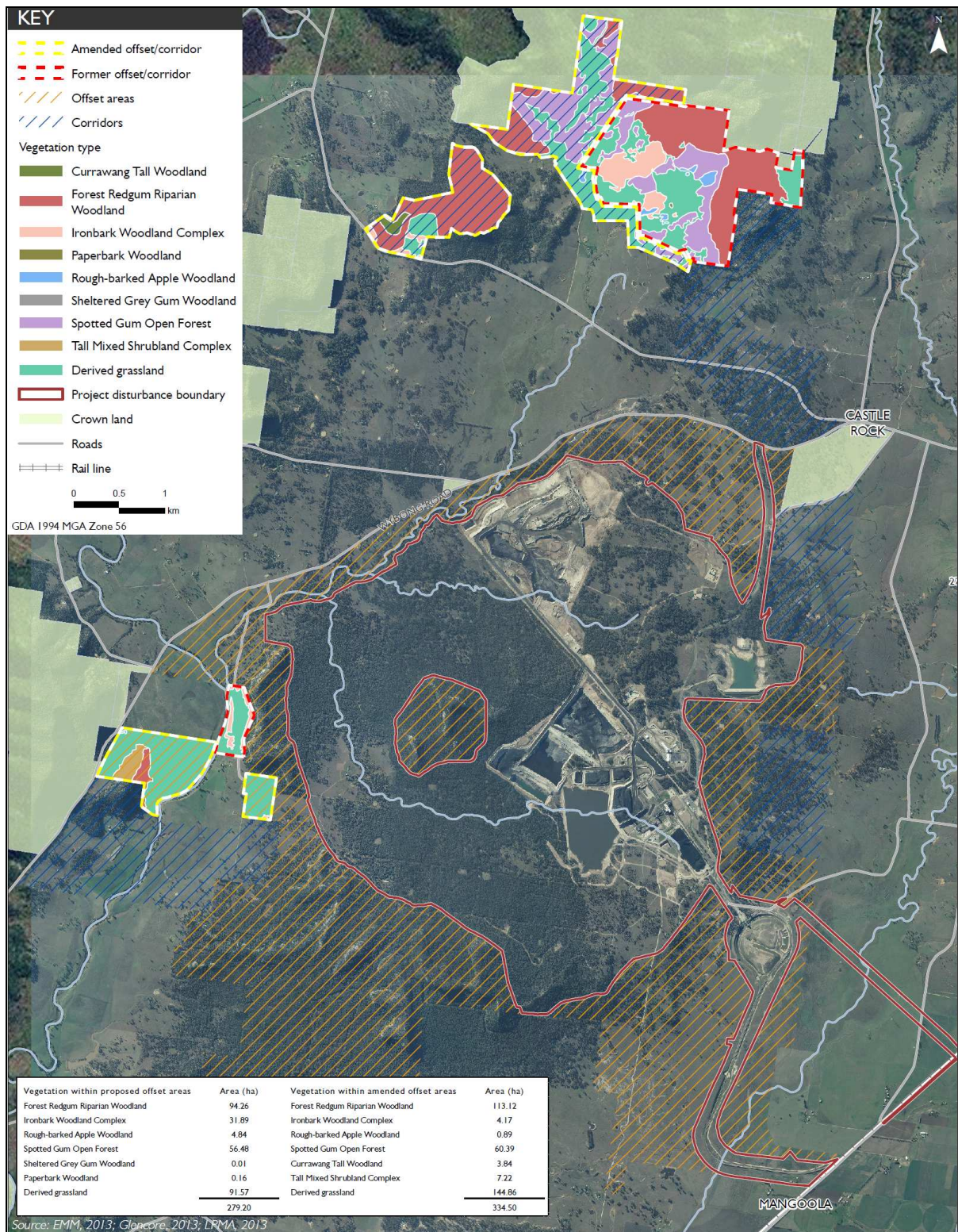


Figure 10: Proposed offset areas

Mangoola Coal has consulted with Registered Aboriginal Parties about the proposed changes to the Biodiversity Offset Strategy, and would update the Aboriginal Heritage Management Plan to reflect the proposed changes. Importantly, the 16 sites of significance that are required to be managed under the project approval are not located in the areas to be excised from the Biodiversity Offset Strategy. Consequently, Planning & Infrastructure is satisfied that adopting the alternative offset areas would not jeopardise the ongoing management of Aboriginal heritage values in the offset areas.

Planning & Infrastructure recognised when the mine was first approved that it may not be possible for the Proponent to acquire all the properties identified in the conceptual plan for offsets. Planning & Infrastructure also acknowledges the difficulty of sourcing offsets in the Hunter Valley with an exact replacement of vegetation communities. Importantly, the total area of the offsets would remain unchanged and Planning & Infrastructure is satisfied that the proposed new areas are consistent with the objectives of the Biodiversity Offset Strategy, including the establishment of habitat corridors connecting the site with areas of nearby Crown land.

Accordingly, Planning & Infrastructure has no objections to the proposed changes to the offset strategy, and has updated the conditions and associated maps to reflect this change. Planning & Infrastructure has also recommended a condition that requires Mangoola Coal to target regeneration of grassland in the offset areas to Ironbark and Spotted Gum woodland communities, and to monitor and report on the progress of this regeneration.

5.10 Other Issues

Planning & Infrastructure is satisfied that all other potential impacts of the proposed modification would be acceptable or could be suitably controlled by the appropriate conditions of approval. These issues and Planning & Infrastructure's assessment are set-out in Table 9 below.

Table 9: Assessment of other issues

Issue	Assessment	Conclusion/Recommended Conditions
Groundwater	- The EA indicates that the proposed modification would not alter the groundwater impacts of the approved project as there would be no change in the mining footprint, including the depth of extraction. - Mangoola Coal is required to implement a Groundwater Monitoring Program and a Surface and Ground Water Response Plan. These plans require extensive groundwater monitoring, comparison with model predictions, use of triggers for remedial action, and regular review and reporting. - Mangoola Coal also holds relevant licences for groundwater extraction under the <i>Water Act 1912</i> and the <i>Water Management Act 2000</i>.	- Planning & Infrastructure is satisfied that there would be no appreciable changes in the predicted groundwater impacts as a result of the proposed modification. - Both Planning & Infrastructure and NOW are satisfied that the existing conditions of approval provide a comprehensive and robust basis for the management and monitoring of groundwater impacts associated with the modified project.
Agriculture	- An Agricultural Impact Assessment was undertaken for the proposal. - The assessment found that the proposed modification would have no direct impacts on agricultural resources as there would be no change in the approved disturbance boundary. - However, the assessment also indicated that the proposed modification has the potential to impact on agricultural resources through the discharge of saline water to the Hunter River.	- As noted above, any discharge of saline water would be managed through the HRSTS which is designed to ensure that water quality in the river remains suitable for agricultural use. - To ensure this is the case, Mangoola Coal would be required to undertake real-time monitoring upstream and downstream of the discharge point, and advise other water users within 2 km of the mine about any proposed discharge. - Given this, and the fact that mining would remain within the approved disturbance boundary, Planning & Infrastructure is satisfied that the proposed modification would not result in any significant impacts on land capability or agricultural resources in the area.
Hazards and Waste	- The increased rate of extraction under the proposal would result in some changes to the rate and staging of tailings emplacement. - However, the overall volume of tailings and available capacity would not change, and hence the existing tailing management arrangements on the site would remain the same.	Planning & Infrastructure is satisfied that there would be no additional impacts as a result of the modification and there are no proposed changes to the project approval.

Issue	Assessment	Conclusion/Recommended Conditions
	The proposal would not result in an increased risk from the storage and use of hazardous materials.	
Aboriginal and European Heritage	- The proposal would not increase the approved disturbance boundary - There would be no changes to the assessed impacts on Aboriginal heritage or any change to the proposed offset areas - The modification does not alter the results of the blasting assessment in respect to potential impacts on European heritage in the area.	- Planning & Infrastructure is satisfied that there would be no additional impacts to heritage items/areas as there is no change to the disturbance footprint of the mine. - The ongoing management of Aboriginal heritage items would be undertaken in accordance with the Aboriginal Cultural Heritage Management Plan. - The approval requires the proponent to ensure that there is no damage to Aboriginal rock shelter sites, Anvil Rock and 'The Book' rock formations.

6. PROPOSED CONDITIONS

Planning & Infrastructure has recommended conditions of approval for the proposed modification (see *Appendix A*). These conditions are required to:

- prevent, minimise, and/or offset adverse impacts of the project;
- ensure standards and performance measures for acceptable environmental performance,
- ensure regular monitoring and reporting;
- provide for the ongoing environmental management of the project; and
- ensure that redundant conditions and commitments have been removed.

Mangoola Coal has reviewed and accepted the recommended conditions. Planning & Infrastructure believe the conditions reflect current best practice for the regulation of coal mines in NSW.

7. CONCLUSION

In summary, the proposal is seeking to increase the approved coal extraction rate at the Mangoola mine by 3 million tonnes a year (from 10.5 to 13.5 Mtpa of ROM coal), and implement various consequential changes to the operations to accommodate the proposed increase.

Planning & Infrastructure has assessed the modification application, EA, submissions on the proposal and Mangoola Coal's RTS in accordance with the relevant statutory requirements. Planning & Infrastructure has also undertaken additional consultation with various stakeholders and has undertaken an inspection of the site and surrounding areas to inform its assessment of the proposal. Further, Planning & Infrastructure commissioned separate air quality and traffic assessments to assist in the detailed assessment of the cumulative impacts associated with the various mining operations to the west of Muswellbrook.

Planning & Infrastructure considers that the coal resource on the site is significant, and extracting the resource more rapidly would result in a range of economic benefits including the creation of an additional 240 jobs. It would also maximise the utilisation of the existing processing and transport infrastructure on the site, and the production of high quality coal in the current relatively difficult market conditions.

In regard to residual impacts, Planning & Infrastructure notes that as a result of updated modelling which has been verified against actual monitoring data, fewer residences are predicted to be exposed to exceedances of the noise criteria. In practice, this means that Mangoola Coal would be required to operate within a tighter approval envelope than is currently the case. In regard to air quality, the cumulative assessment commissioned by Planning & Infrastructure confirms that the proposal would not result in any additional exceedances of the air quality criteria in the areas surrounding the mine.

Planning & Infrastructure is also satisfied that the proposed discharge of saline water would not result in any significant impacts on water resources and would be appropriately managed in accordance with the HRSTS. The proposed changes to the final landform may result in a marginal increase in visual impacts, but Planning & Infrastructure is satisfied that this would be adequately offset by the long term benefits associated with a more natural final landform. Finally, in regard to infrastructure and services, Planning & Infrastructure considers that the proposal would not result in any significant impacts, and that the revised VPA offer to Council adequately addresses any additional demands in this regard. The exception is Thomas Mitchell Drive where Planning & Infrastructure has recommended a condition for Mangoola Coal to contribute towards the upgrade and maintenance of this road and the intersection with Denman Road in accordance with the GHD Contributions Study.

Given these considerations, Planning & Infrastructure has considered that the proposal would not significantly increase the impacts of the approved project, and that the residual impacts be adequately managed mitigated and managed through the implementation of the conditions recommended by Planning & Infrastructure which have been updated to reflect current best practice. With these measures in place, Planning & Infrastructure is satisfied that the project is able to be conducted in a manner that would not increase the impacts of the current operations, and would not result in any significant additional impacts on surrounding land users or the environment.

On balance, Planning & Infrastructure considers the proposal to be a reasonable and logical amendment to the existing Mangoola mine, as it would improve the efficiency and profitability of the mine, without increasing the disturbance footprint, or the consequential environmental impacts of the mine. Consequently, Planning & Infrastructure believes the project's benefits would sufficiently outweigh its costs and it is in the public interest and should be approved, subject to stringent conditions.

8. RECOMMENDATION

It is RECOMMENDED that the Planning Assessment Commission, as delegate for the Minister:

- considers the findings and recommendations of this report;
- determines that the proposed modification is in the scope of Section 75W of the EP&A Act;
- approves the application to modify the project approval, subject to conditions, under Section 75W of the EP&A Act; and
- signs the attached Notice of Modification to the project approval (see Appendix A).

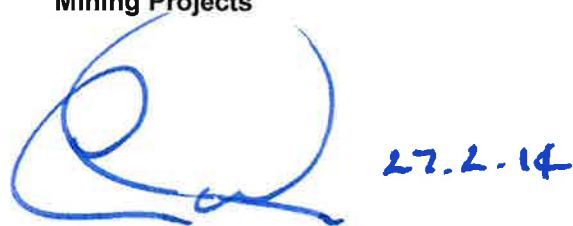


Mike Young
Manager
Mining Projects

26.2.14



David Kitto
Director
Mining Projects



Chris Wilson
Executive Director
Development Assessment Systems and Approvals

27.2.14

APPENDIX A

NOTICE OF MODIFICATION

APPENDIX B

CONSOLIDATED PROJECT APPROVAL

APPENDIX C

CONSIDERATION OF ENVIRONMENTAL PLANNING INSTRUMENTS

SEPP No. 33 – Hazardous and Offensive Development

Planning & Infrastructure (P&I) is satisfied that the proposed modification is not potentially hazardous or offensive, and that the proposal is generally consistent with the aims, objectives and requirements of SEPP 33.

SEPP No. 44 – Koala Habitat Protection

Planning & Infrastructure is satisfied that the proposed modification is unlikely to affect koala habitat, and the modification is generally consistent with the aims, objectives and requirements of SEPP 44.

SEPP No. 55 – Remediation of Land

The proposed modification does not extend the disturbance footprint of the approved mine. Given this, Planning & Infrastructure is satisfied that the proposed modification does not have a significant risk of contamination and the proposed modification is generally consistent with the aims, objectives, and provisions of SEPP 55.

SEPP (Infrastructure) 2007

SEPP (Infrastructure) 2007 requires the consent authority to notify relevant public authorities about developments that may affect public infrastructure or public land. Planning & Infrastructure notified Council and the RMS given the use of public roads by the project. Neither RMS nor Council object to the proposed modification, and any recommendations made by these authorities have been considered by Planning & Infrastructure, and incorporated into the project approval where appropriate. This satisfies the requirements of *SEPP (Infrastructure) 2007*.

SEPP (Mining, Petroleum Production and Extractive Industries) 2007

Part 3 of the Mining SEPP lists a number of matters that a consent authority must consider before determining an application for consent for development for the purposes of mining including:

- compatibility of the proposal with other land uses;
- natural resource management and environmental management;
- resource recovery;
- transport; and
- rehabilitation.

Planning & Infrastructure has considered all of these matters in its assessment report. Based on this assessment, Planning & Infrastructure is satisfied that the proposals are able to be managed in a manner that is generally consistent with the aims, objectives and provisions of the Mining SEPP.

Muswellbrook Local Environmental Plan 2009

Planning & Infrastructure is satisfied that the proposed modification is generally consistent with the aims and objectives of the LEP.

Hunter Regional Environmental Plan (REP) 1989 (Heritage)

Planning & Infrastructure is satisfied that the proposed modification would not have an impact on historic heritage items in the vicinity of the site, and that the modification can be carried out in a manner that is generally consistent with the aims, objectives, and the provisions of the REP.

APPENDIX D

ENVIRONMENTAL ASSESSMENT

Refer to Planning & Infrastructure's website:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5732

APPENDIX E

COPY OF SUBMISSIONS

Refer to Planning & Infrastructure's website:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5732

APPENDIX F

RESPONSE TO SUBMISSIONS

Refer to Planning & Infrastructure's website:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5732

APPENDIX G

CUMULATIVE AIR QUALITY STUDY