

**MAJOR PROJECT ASSESSMENT:
Mt Arthur Coal Consolidation
Project
(09_0062)**



Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

September 2010

Cover photo: View to Mt Arthur across Mt Arthur North Pit
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EXECUTIVE SUMMARY

Mt Arthur Coal, a subsidiary of BHP Billiton, operates the Mt Arthur coal mine complex, approximately 5 kilometres south of Muswellbrook in the Upper Hunter Valley (see Figure 1). The mine comprises 4 separate mining areas, including:

- Bayswater No. 2 Open Cut (extraction complete);
- Bayswater No. 3 Open Cut;
- Mt Arthur North Open Cut; and
- Mt Arthur Underground.

The combined operations have approval to extract up to 28 million tonnes of run-of-mine (ROM) coal a year.

Mt Arthur Coal proposes to expand its open cut operations and increase the total rate of coal production at the mine complex. The company also proposes to consolidate all of its existing open cut mining approvals into a single, modern approval.

The proposal – known as the Mt Arthur Coal Consolidation Project – involves increasing the total extraction rate of the complex to 36 million tonnes of ROM coal a year. This would be achieved through expanding open cut mining into 5 new areas adjoining the existing pits, and increasing the extraction rate of open cut mining from 20 to (up to) 32 million tonnes of ROM coal a year.

Extracted coal would be processed in Mt Arthur Coal's existing coal handling and preparation facilities and then transported to market using existing rail loading and conveyor facilities. These facilities would be upgraded to service the project.

The project has a capital investment value of approximately \$784 million, and would generate an additional 720 operational jobs at the mine.

The proposal constitutes a 'major project' under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as it is development for the purpose of coal mining, and consequently requires the Minister's approval.

The Department exhibited the Environmental Assessment of the project from 13 November 2009 to 28 December 2009, and received 18 submissions on the project: 6 from government authorities and 12 from the general public, including 2 from special interest groups. Most of the public submissions either objected to or raised concerns about the project, with the main issues being the potential air quality, noise, blasting, visual and water impacts of the project.

The Department has assessed the project application, EA, submissions on the project, and Mt Arthur Coal's response to submissions, in accordance with the objects of the EP&A Act and principles of ecologically sustainable development.

This assessment has found that the project would have a number of adverse environmental impacts, including significant dust and/or noise impacts on 21 privately-owned properties (owned by 16 separate landowners), and the clearing of 842 hectares of endangered ecological community (although almost 700 hectares of this contains only the remnant grassland component of the EEC). The project would also increase the visual affects of the mine complex, and could affect alluvial aquifers associated with the Hunter River.

However, the Department is satisfied that these impacts can be adequately mitigated, managed and/or offset, and has recommended a range of conditions to ensure this occurs. These include requirements for Mt Arthur Coal to implement additional measures to minimise the noise, dust, blasting, visual and water impacts of the project, to purchase the 21 significantly affected properties upon request, and to implement a comprehensive biodiversity offset strategy which would ultimately see the long term conservation of some 3,000 hectares of vegetation.

The Department's assessment has also found that the project would represent a logical extension of the existing mine complex, would make use of existing infrastructure and facilities,

and would provide major economic and social benefits for the Hunter region and NSW, including:

- a direct capital investment in the mine complex of \$784 million;
- generating 720 direct new jobs at the mine complex; and
- generating almost 2,000 new direct and indirect jobs across NSW.

On balance, the Department believes that the project's benefits sufficiently outweigh its residual costs, and that it is therefore in the public interest and should be approved, subject to conditions.

1. BACKGROUND

Hunter Valley Energy Coal Pty Limited (trading as Mt Arthur Coal) operates the Mt Arthur open cut and underground coal mine complex, located approximately 5 kilometres south of Muswellbrook in the Upper Hunter Valley (see Figure 1). The mine complex comprises 4 separate mining areas, including:

- Bayswater No. 2 (extraction complete);
- Bayswater No. 3 (operating under DA 210/93);
- Mt Arthur North (operating under DA 144-05-2000 and MP 06_0108); and
- Mt Arthur Underground (operating under MP 06_0091).

The combined operations have approval to extract 28 million tonnes of run-of-mine coal a year (Mtpa), including 20 Mtpa from the open cut operations (Bayswater No. 3 and Mt Arthur North) and 8 Mtpa from the underground operations (Mt Arthur Underground).

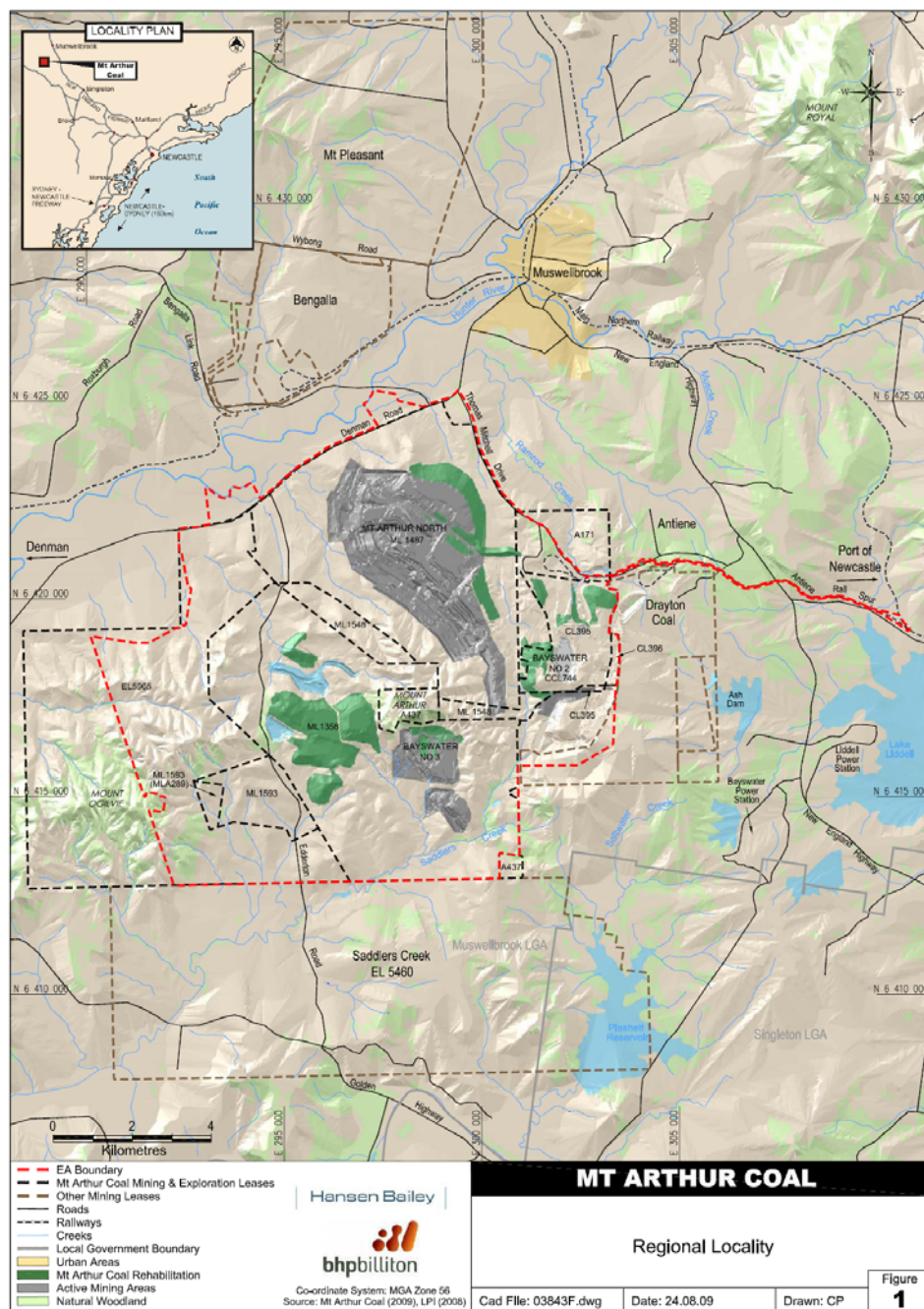


Figure 1: Regional Context

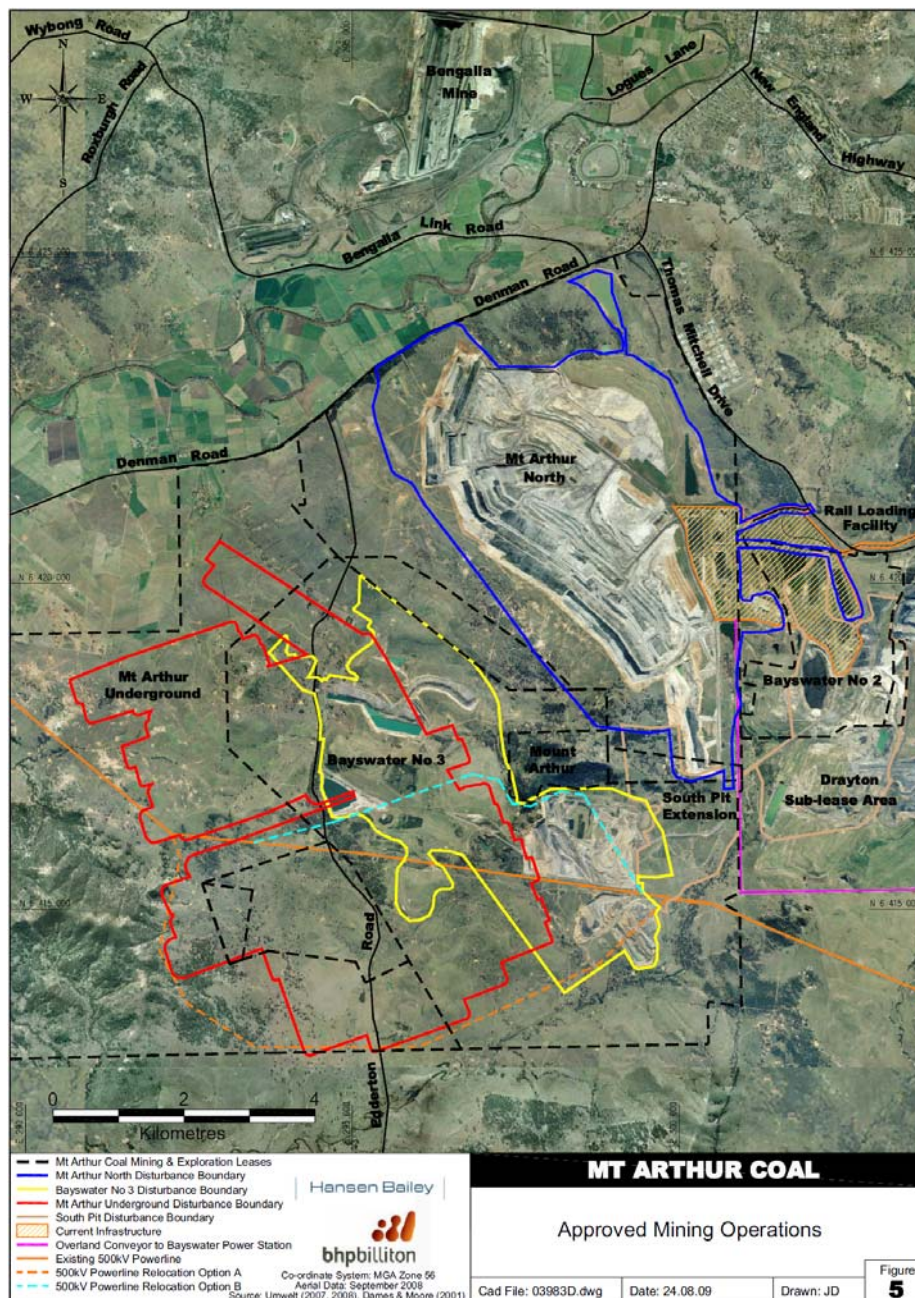


Figure 2: Mt Arthur Coal Mine – Approved Operations

2. PROPOSED PROJECT

2.1 Project Description

Mt Arthur Coal proposes to expand its open cut operations and increase the total rate of coal production at the mine complex. The company also proposes to consolidate all of its existing open cut mining approvals into a single, modern approval.

The proposal – known as the Mt Arthur Coal Consolidation Project – involves increasing the total extraction rate of the complex to 36 million tonnes of run-of-mine (ROM) coal a year. This would be achieved through expanding open cut mining into 5 new areas adjoining the existing pits, and increasing the extraction rate of open cut mining from 20 to (up to) 32 million tonnes of ROM coal a year.

Extracted coal would be processed in Mt Arthur Coal's existing coal handling and preparation facilities and then transported to market using existing rail loading and conveyor facilities. These facilities and other mine infrastructure would be upgraded to service the project.

The major components of the project are summarised in Table 1, and depicted on Figure 3. The project is described in full in Mt Arthur Coal's Environmental Assessment (EA), which is attached as Appendix F.

Table 1: Major Components of the Project

Aspect	Description
Project Summary	- expanding open cut mining operations at the mine, and increasing the total production rate at the mine complex to 36 million tonnes of ROM coal a year, with up to 32 million tonnes coming from open cut operations; - augmenting, upgrading and using the existing surface infrastructure at the mine, including the construction of a new coal loader; - relocating a section of Edderton Road; - exporting up to 27 million tonnes of product coal a year from the complex by rail; - rehabilitating the site; and - consolidating all the existing open cut mining approvals into a single, modern planning approval.
Mining and Reserves	Extraction of an additional coal resource of approximately 100 million tonnes.
Production	Total production from the Mt Arthur mine complex would increase to 36 million tonnes of ROM coal a year. Extraction from open cut operations would increase to up to 32 million tonnes of ROM coal a year, subject to a commensurate decrease in underground extraction so as not to exceed the combined total of 36 million tonnes.
Project Life	12 years (to 2022).
Coal Washing	Upgrade of the existing Mt Arthur Coal coal handling and preparation plant (CHPP), including construction and operation of a new ultra-fines coal plant to reprocess fines and facilitate increased resource recovery, reduce water demand and reduce waste.
Product Coal Transport	Product coal would be transported via existing rail loading (export coal) and conveyor facilities (domestic coal). A second rail loading facility would be constructed to increase capacity.
Overburden Emplacement	Overburden would be placed in the existing emplacements at Mt Arthur North (up to 375m AHD, average 360m AHD), Bayswater No.3 (Saddlers Pit)(up to 250m AHD) and the Drayton sub-lease (up to 290m AHD), as well as a new out-of pit emplacement up to 360m AHD.
Coarse Rejects and Tailings Management	Coarse rejects and tailings would continue to be disposed of within existing voids and overburden emplacements in the Bayswater No.2, Bayswater No.3, Mt Arthur North and the adjacent Drayton West Pit. The height of the tailings facility would be increased to an RL of 280 m AHD.
Infrastructure	- Extension to (or additional) pit top facilities including office, workshop, store and bathhouse; - Upgrade of the existing Mt Arthur CHPP including a new ultra-fines plant, reject facility, coal washing modules and additional ROM coal hopper facilities; - Additional ROM coal storage and handling infrastructure, including conveyors and stockpiles; - Additional rail loading facility and associated enclosed conveyor; - New internal road intersection; - Re-alignment of Edderton Road; and - Modifications to site services including powerlines and the water management and reticulation system.
Employment	Peak construction workforce of 240 personnel and an additional operational workforce of 720 personnel, taking total peak employment to 2,600 at the mine complex.
Capital Value	\$783,900,000
Hours of Operation	24 hours a day, 7 days a week.
Rehabilitation and Offsets	The project involves the disturbance of 1,078 hectares of land, including 240 hectares of native trees and 842 hectares of vegetation that constitutes an endangered ecological community (much of which is grassland). The project disturbance area would be progressively rehabilitated. The project includes an offset strategy comprising external (off-site) offsets of some 992 hectares. In total (ie. offsets + rehabilitation) the project would ultimately conserve over 3,000 hectares.
Community Contributions	The project would contribute \$10 million towards local road works and community projects.

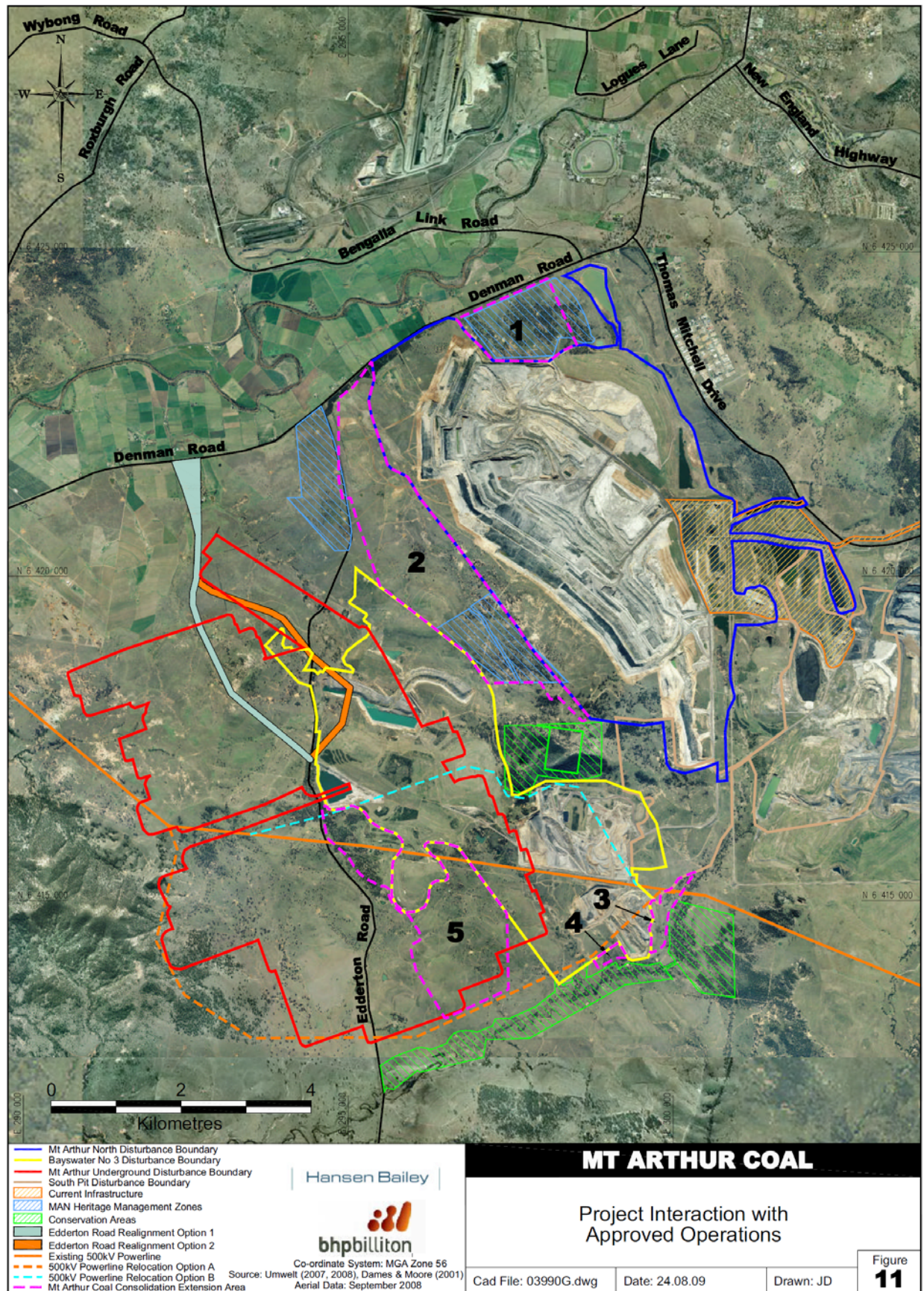


Figure 3: Proposed Mine Expansion Areas (numbered)

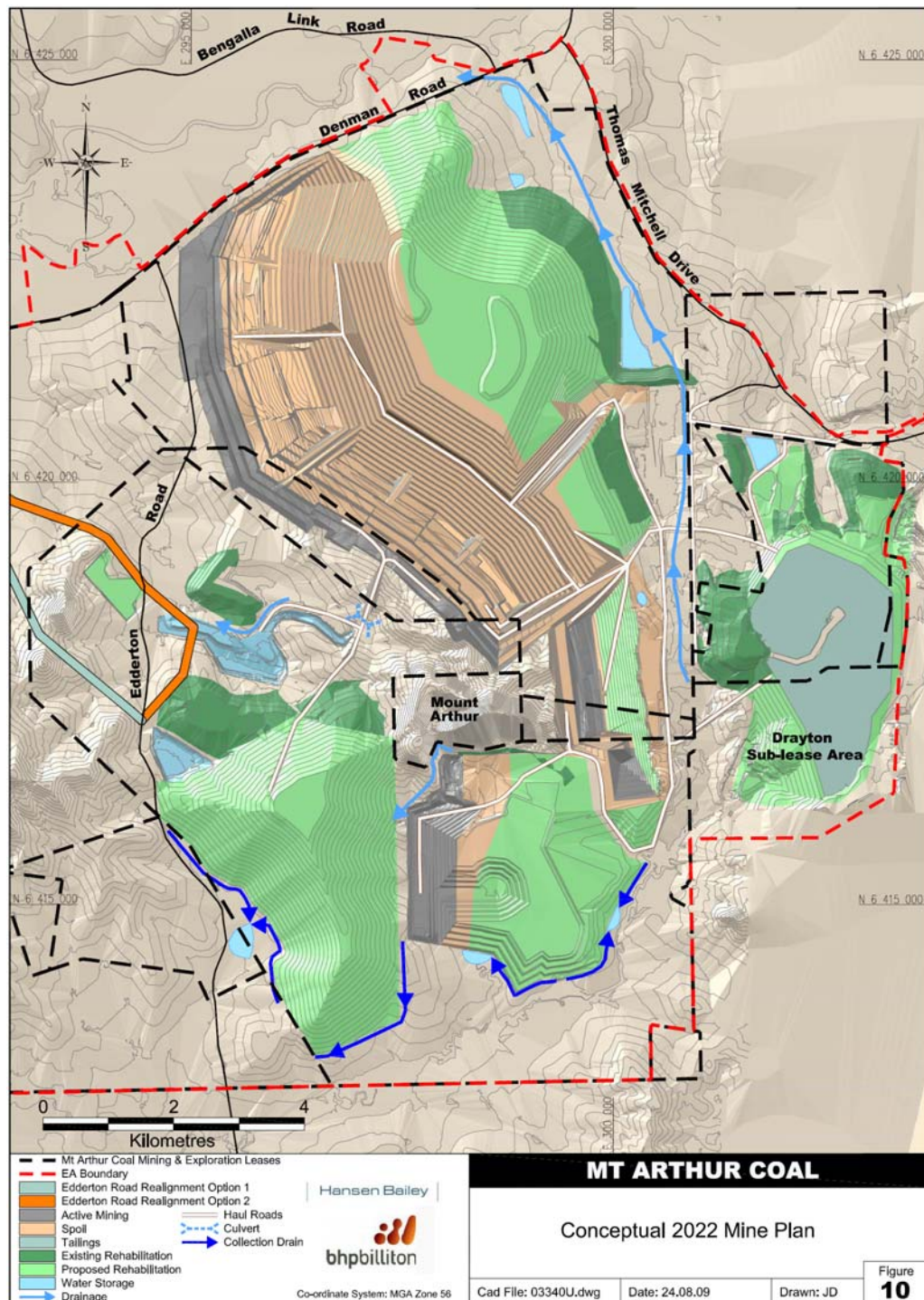


Figure 4: Conceptual 2022 Mine Layout

2.2 Project Setting

The Mt Arthur mine complex is located approximately 5 kilometres south-west of Muswellbrook in the Upper Hunter Valley.

The mine complex is situated in an area of intensive coal mining activity, with the Bengalla open cut mine located to the north across Denman Road, and the Drayton open cut mine located directly to the east (Drayton also owns much of the land to the south – as shown on Figure 5).

Other industrial-related land uses in the area include Macquarie Generation's Bayswater and Liddell power stations to the east (beyond the Drayton mine), and a small-lot industrial area on Thomas Mitchell Drive immediately to the north-east of the mine complex.

Most of the sensitive residential and rural land uses (including wineries and horse studs) are located to the north, north-east and west of the mine complex.

Sensitive receivers in the locality include the:

- Antiene rural-residential area to the north-east, located approximately 3 km from the mining areas and adjacent to the Antiene Rail Spur;
- South Muswellbrook residential area to the north, located approximately 4 km from the mining areas and 5 km from the Antiene Rail Spur;
- Racecourse Road rural-residential area to the north, located approximately 3 km from the mining areas and 7 km from the Antiene Rail Spur; and
- Denman Road rural-residential area to the north-west, located approximately 3 km from the mining areas and 8 km from the Antiene Rail Spur.

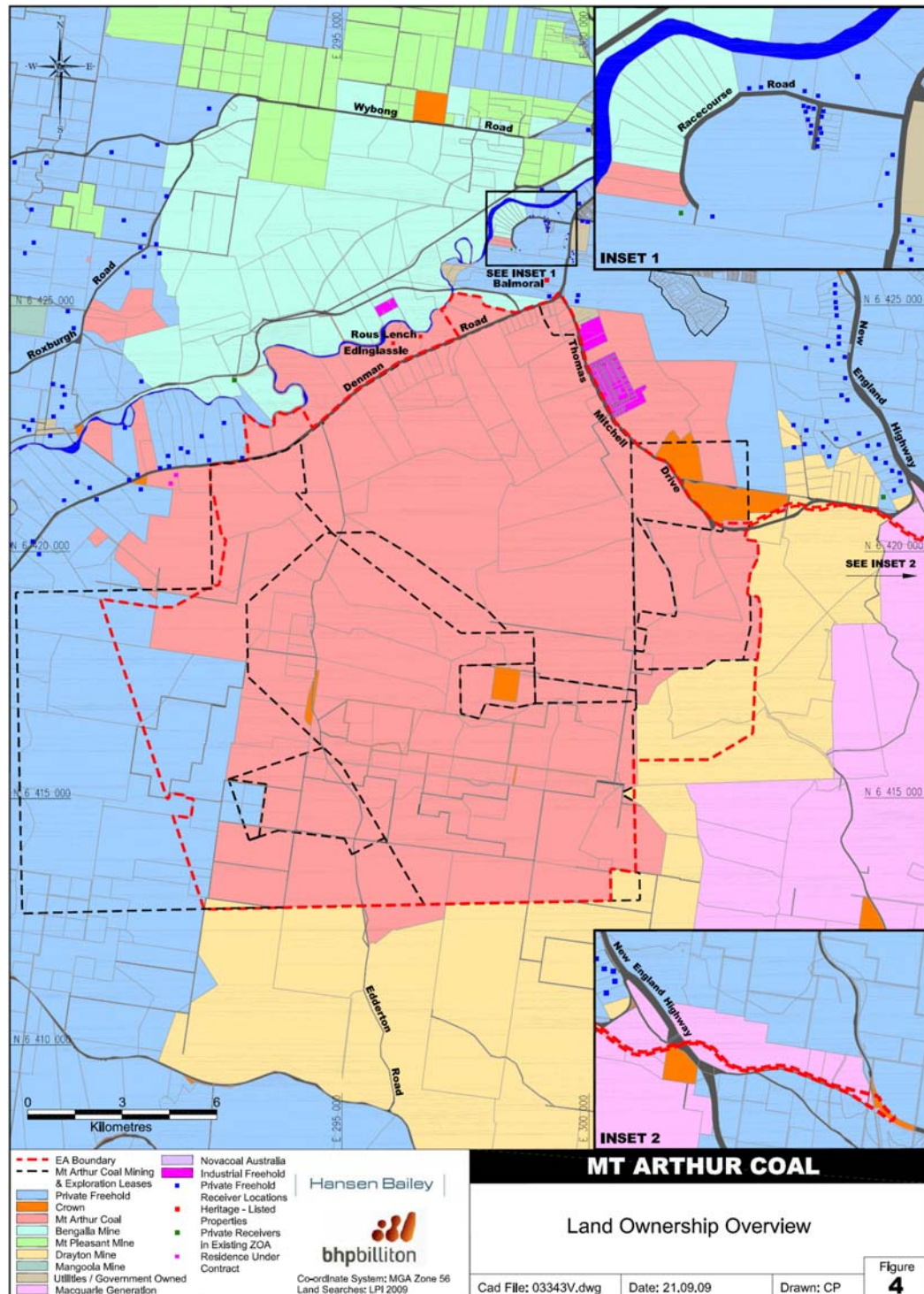


Figure 5: Land Ownership Plan

3. STATUTORY CONTEXT

3.1 Major Project

The proposal is classified as a major project under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act), because it is development for the purpose of coal mining, and therefore triggers the criteria in Clause 5 of Schedule 1 of *State Environmental Planning Policy (Major Projects) 2005*.

Consequently, the Minister for Planning is the approval authority for the project.

3.2 Permissibility

The land subject to the application is primarily zoned RU1 Primary Production under the *Muswellbrook Local Environmental Plan (LEP) 2009*, with a smaller portion zoned E3 Environmental Management.

Mining is permissible with consent in the RU1 zone, and prohibited in the E3 zone.

Notwithstanding, *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* makes open cut mining permissible with consent on all land in the project area. This is because the SEPP allows mining to be carried out on any land where agriculture may be carried out, and agriculture is permissible in both the RU1 zone and E3 zone under the LEP.

Consequently, the Minister may approve the project application.

It is noted that the E3 zone required to be disturbed for the project already has approval to be disturbed in part under the existing approvals for the mine complex. The project's impacts on the environmental values of the site, including the E3 zone, are considered in Section 5 of this report.

3.3 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 under the *Heritage Act 1977* and *National Parks and Wildlife Act 1974*; and
- some water-related approvals under the *Rivers and Foreshores Improvement Act 1948* and *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. These include:

- a mining lease under the *Mining Act 1992*;
- an approval under the *Mine Subsidence Compensation Act 1961*;
- an environment protection licence under the *Protection of the Environment Operations Act 1997*; and
- a consent under the *Roads Act 1993*.

The Department has consulted with the relevant government authorities responsible for these other approvals (see Section 3.5), and considered the relevant issues relating to these approvals in its assessment of the project (see Section 5). None of the relevant authorities object to the project on grounds related to these other approvals.

3.4 Exhibition and Notification

Under Section 75H(3) of the EP&A Act, the Director-General is required to make the Environmental Assessment (EA) of a project publicly available for at least 30 days.

After accepting the EA for the project, the Department:

- made it publicly available from 13 November until 28 December 2009:
 - o on the Department's website,
 - o at the Department's Information Centre and Muswellbrook Shire Council, and
 - o at the offices of the Nature Conservation Council;
- notified landowners in the vicinity of the project about the exhibition period by letter;
- notified relevant State government authorities and Muswellbrook Council by letter; and
- advertised the exhibition in the *Muswellbrook Chronicle* and *Hunter Valley News* (Muswellbrook).

This satisfies the requirements in Section 75H(3) of the EP&A Act.

3.5 Environmental Planning Instruments

Under Section 75I of the EP&A Act, the Director-General's report is required to include a copy of or reference to the provisions of environmental planning instruments that substantially govern the carrying out of the project.

The Department has considered the project against the relevant provisions of several *State Environmental Planning Policies* (SEPPs) and other environmental planning instruments (see Appendix C), and is satisfied that none of these instruments substantially govern the carrying out of this project.

3.6 Objects of the Environmental Planning and Assessment Act 1979

The Minister is required to consider the objects of the EP&A Act when he makes decisions under the Act. The objects of most relevance to the Minister's decision on whether or not to approve the proposed modifications are found in Section 5(a)(i),(ii),(vi)&(vii). They are:

'The objects of this Act are:

(a) to encourage:

- (i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
- (ii) the promotion and co-ordination of the orderly and economic use and development of land,*
- (vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
- (vii) ecologically sustainable development (ESD).'*

The Department is satisfied that the project encourages the proper use of resources (Object 5(a)(i)) and the promotion of orderly and economic use of the land (Object 5(a)(ii)), particularly as the subject coal resource is located in the centre of existing mining activities and is able to be undertaken using existing mining facilities and infrastructure.

Consideration of environmental protection (Object 5(a)(vi)) is provided in Section 5 of this report. Following its consideration, and based on additional biodiversity commitments from Mt Arthur Coal, the Department is satisfied that the project is able to be undertaken in a manner that would maintain and potentially improve biodiversity values of the locality in the medium to long term.

The Department has considered the encouragement of ESD (Object 5(a)(vii)) in its assessment of the project application. This assessment integrates all significant economic and environmental considerations and seeks to avoid any serious or irreversible damage to the environment, based on an assessment of risk-weighted consequences. Mt Arthur Coal has considered a number of alternatives to the proposed project (including the alternative of not proceeding) and considered the proposal in the light of the ESD principles (see Appendix F).

3.7 Statement of Compliance

Under Section 75I of the EP&A Act, the Director-General's report is required to include a statement relating to compliance with the environmental assessment requirements of the project.

The Department is satisfied that the environmental assessment requirements have been complied with.

4. ISSUES RAISED IN SUBMISSIONS

During the exhibition period, the Department received 18 submissions on the project:

- 6 from public authorities (I&I NSW, DECCW, NOW, RTA, Heritage Branch and Muswellbrook Council);

- 2 from special interest groups (CFMEU and Energy Australia); and
- 10 from the general public.

A summary of the issues raised in submissions is provided below. A full copy of the submissions is attached in Appendix E.

4.1 Public Authorities

The **Department of Industry & Investment** (I&I NSW) does not object to the project, although it commented that the level of information in the EA on rehabilitation and final landform was generally poor. I&I NSW recommended additional information be provided in this regard, and recommended conditions requiring Mt Arthur Coal to develop a comprehensive Rehabilitation Strategy and Rehabilitation Plan, including provisions for a final land use statement, performance objectives, completion criteria, monitoring and research, and post-closure maintenance.

I&I NSW also noted the potential for impacts on agricultural land use within and adjacent to the EA boundary.

The **Department of Environment, Climate Change and Water** (DECCW) initially stated that it could not support the project, as it believed that the offset strategy in the EA was inadequate to compensate the project's impacts on threatened species. Mt Arthur has subsequently committed to additional offset areas, and the Department has considered this issue in Section 5.6. DECCW is comfortable with this approach.

DECCW also made comments in relation to:

- noise, in particular rail noise on the Antiene Rail Spur;
- Aboriginal heritage, particularly in relation to obtaining feedback from the Aboriginal community on the proposed management measures;
- air quality, including the potential for enclosing conveyors as a dust management strategy; and
- greenhouse gas and energy efficiency.

The **NSW Office of Water** (NOW) does not object to the project, and accepts Mt Arthur Coal's commitment to maintain a setback of 150 metres to the Hunter River alluvials unless agreement can be reached with NOW regarding appropriate groundwater safeguards.

NOW notes that all groundwater (and surface water) loss caused by the project must be appropriately accounted for (and licenced) in accordance with the rules of the relevant water sharing plans, and recommended a number of conditions in this regard.

The **Roads and Traffic Authority** (RTA) does not object to the project, but recommended that Mt Arthur Coal be required to upgrade some local intersections (and demonstrate the feasibility of these intersection upgrades). The RTA also noted that it did not support the proposed speed limit reduction on Thomas Mitchell Drive (as recommended in a recent audit), but acknowledged that this is a Council road.

The **NSW Heritage Branch** does not object to the project, but noted that the proposed mitigation measures for some heritage items were inadequate, and as such recommended conditions requiring:

- archival recording of items scheduled for demolition;
- consultation with the Heritage Branch, and preparation of a landuse study and architectural report in relation to the proposed relocation of heritage items;
- compliance with relevant vibration criteria at heritage properties, and a heritage architect be involved in assessing any blast-related impacts; and
- the protection of heritage items near the proposed realignment of Edderton Road.

Muswellbrook Shire Council does not object to the project, but noted that it does not support the use of previously mined or disturbed land for offsetting biodiversity impacts of the project.

Council recommended some 20 conditions in relation to:

- protecting Aboriginal and non-indigenous heritage;
- managing rehabilitation and final landform, including restricting the height of emplacements to 320 metres AHD and requiring a horse stud type fence along Denman Road;
- retaining relevant conditions in existing consents for the mine complex;
- maintaining agricultural productivity of undisturbed land acquired by Mt Arthur Coal;

- requiring offset areas to be clearly defined;
- acquiring properties significantly affected by noise and dust, and providing additional noise mitigation measures;
- providing contributions for ongoing environmental assessment, community enhancement and greenhouse gas emissions, and ensuring generous uptake of first year apprentices;
- requiring continuous air monitoring, including assessment of very fine particulate matter (PM_{2.5});
- maintaining water quality and supply;
- ensuring public reporting of monitoring results and reports;
- undertaking studies regarding rail and road infrastructure; and
- minimising sunlight loss associated with bunds.

The Department has considered these matters in its assessment of the project, and Mt Arthur Coal has amended its Statement of Commitments in consideration of Council's recommendations. In particular, Mt Arthur Coal and Council have agreed the terms of a voluntary planning agreement for the project, that provides over \$10 million in contributions towards local road upgrades and community enhancement.

4.2 Special Interest Groups

Energy Australia does not object to the project, but noted that the mining area is moving closer to its high voltage transmission lines and that the blast management plan should take into account the potential impact of blasting on this infrastructure. It also noted that the proposed relocation of Edderton Road would require the relocation of a powerline along this road.

The **Construction Forestry Mining and Energy Union** supports the project.

4.3 Community

Of the 10 submissions from the general public (including 1 from Darley Australia, which owns the Woodlands and Kelvinside horse studs), 7 objected to the project, while the other 3 did not object but raised concerns.

The main concerns and grounds for objection were (in decreasing order of mention):

- air quality;
- noise;
- blasting;
- visual and light spill; and
- water.

4.4 Response to Submissions

Mt Arthur Coal has provided a response to the issues raised in submissions, and revised its Statement of Commitments for the project (see Appendix D). These have been made publicly available on the Department's website.

The Department has considered the issues raised in submissions, and Mt Arthur Coal's response to these issues, in its assessment of the project.

5. ASSESSMENT

5.1 Air Quality

The EA includes a specialist air quality impact assessment undertaken by PAE Holmes Pty Ltd in accordance with applicable guidelines, including DECCW's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*. The assessment includes consideration of total suspended particulates (TSP), fine particulate matter (PM₁₀), and dust deposition, with reference to relevant 24-hour, monthly and annual air quality goals.

The assessment also includes consideration of sulphur dioxide (SO₂) and oxides of nitrogen (NO_x) associated with diesel use and blast fumes, concluding that the emissions would be negligible. While the Department is satisfied that SO₂ and NO_x emissions would be minor, and do not warrant further assessment, the Department has recommended conditions requiring Mt Arthur Coal to minimise the fumes generated by blasting.

The assessment includes consideration of the incremental dust increases caused by the project (ie. the mine complex), and the total cumulative emissions generated by the project and existing background dust levels (including those from neighbouring mines such as Drayton and Bengalla), with reference to DECCW's relevant 24-hour, monthly and annual air quality goals.

Further, the assessment is based on the implementation of a number of existing and proposed mitigation measures, including:

- minimising the area of disturbance as far as practicable;
- using water carts and water sprays in coal handling areas and on coal stockpiles;
- enclosing all conveyors;
- using water carts and/or dust suppressants on all haul roads and trafficable areas;
- minimising the number of roads, and rehabilitating disused roads;
- revegetating topsoil stockpiles;
- using dust management measures (eg. dust aprons, extraction systems and/or water sprays) during drilling operations; and
- using adequate stemming in blast drill holes.

The results of the modelling, based on these mitigation measures, is depicted in Figure 6 below.

At the regional scale, the assessment indicates that the project would comfortably comply with the relevant air quality goals in Muswellbrook and the broader Upper Hunter Valley, when considered both incrementally and cumulatively. The worst case predicted dust levels in Muswellbrook (and South Muswellbrook) are shown in the following table.

Table 2: Predicted Regional Air Quality Impacts (Muswellbrook)

Pollutant	Averaging Period / Units	Criterion	Max. Predicted Incremental Dust Level (approx.)	Max. Predicted Total Dust Level (approx.)
Total suspended particulate (TSP) matter	Annual / $\mu\text{g}/\text{m}^3$	90	2	70
Particulate matter < 10 μm (PM ₁₀)	Annual / $\mu\text{g}/\text{m}^3$	30	2	25
	24 hour / $\mu\text{g}/\text{m}^3$	50	<30	.*
Deposited Dust	Annual / $\text{g}/\text{m}^2/\text{month}$	2 (max. increase)	<0.1	-
		4 (total)	-	1

* Not assessed, due to inherent technical difficulties in establishing a suitable background for 24-hour PM₁₀.

Based on the modelling, the Department is satisfied that the project would have only a minor contribution to the regional air shed, and that the air shed has capacity to accommodate this minor contribution.

However, at the local scale, the assessment indicates that, even with the implementation of the above mitigation measures, the project would exceed the applicable air quality criteria at a number of properties in the rural area immediately surrounding the mine complex.

The affected properties are located in the rural-residential areas around Racecourse Road to the north, and Denman Road/Roxburgh Road to the northwest, of the mine complex (see Figure 6). This affected area is downwind of the prevailing south-easterly winds that occur in the Hunter Valley during the summer months. (During the winter months the prevailing winds are north-westerlies, with the resultant affected area occurring to the south-east of the mine complex, in areas owned by mining companies and Macquarie Generation). Within the affected rural area, there are 2 main clusters of properties where most of the impacts would occur.

The first is the Racecourse Road area, located to the north-north-west of the Mt Arthur mine complex and to the east of the Bengalla mine. This area would be impacted during the early years of the project (ie. before 2016) when mining is in the northern expansion area (see mine area 1 on Figure 3).

The second is the Denman Road West area, located to the west-north-west of the Mt Arthur mine complex and to the west of the Bengalla mine. This area would be impacted during the latter years of the project (ie. 2016-2022) as mining progresses to the west (see mine area 2 on Figure 3).

In total, the project is predicted to exceed the relevant air quality criteria on a total of 19 privately-owned properties, owned by 14 separate landowners. Of these 19 properties, 3 are within existing affectation areas under existing mining approvals (ie. Mt Arthur and Bengalla development consents).

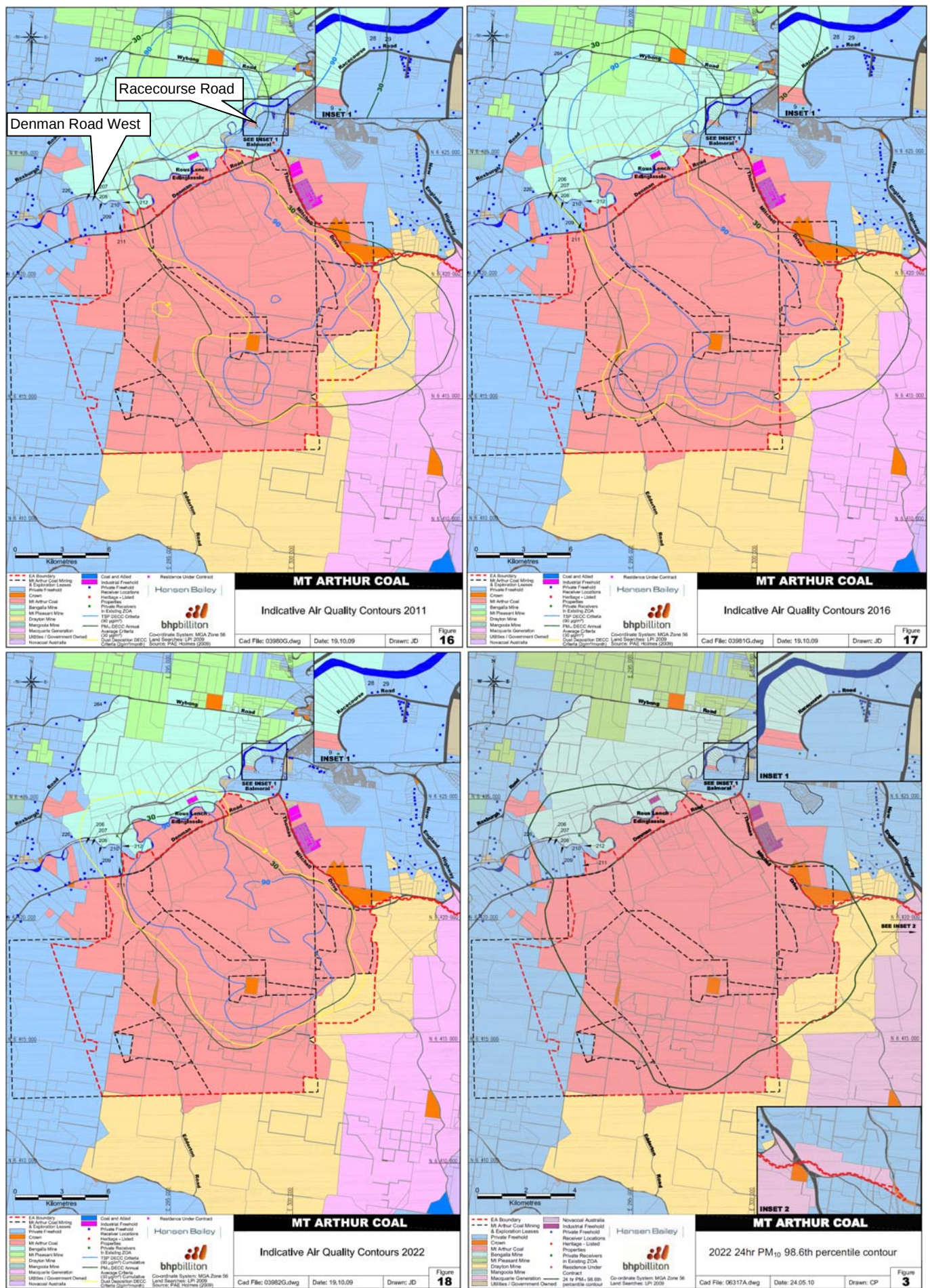


Figure 6: Predicted Air Quality Contours

The project is also predicted to have moderate dust impacts on a further 10 properties (8 of which are in the Denman Road West area, with the other 2 in the Antiene area), which are predicted to experience 24-hour PM₁₀ levels above the air quality goal but on 5 days a year or less.

A summary of the significantly affected properties is presented in Table 3 below. Figure 6 shows the predicted dust contours.

Table 3: Summary of Significantly Affected Private Properties (exceedances shown only)

Receiver Area	Receiver No.	Receiver	Modelling Year	PM10			TSP	Dust Deposition	
				Annual / $\mu\text{g}/\text{m}^3$	24-hour/ $\mu\text{g}/\text{m}^3$		Annual/ $\mu\text{g}/\text{m}^3$	Annual/ $\text{g}/\text{m}^2/\text{month}$	
				30	50 for >5 days/yr		90	2 (max increase)	4 (total)
Criterion					Max.	No. days			
Residences									
Racecourse Road	9 ¹	Englebrecht	2011	32	-	-	-	-	-
	28	McGoldrick	2011	31	-	-	-	-	-
	29	Barnett	2011	31	-	-	-	-	-
Denman Road West	206	Wild	2022	-	66	9	-	-	-
	207, 208	Zahra	2016	-	64	8	-	-	-
			2022	-	77	20	-	2.3	-
			209, 210, 211	Rankin	2016	31	81	25	-
			2022	-	95	46	-	3.2	-
	212 ¹	Chudyk	2016	38	86	35	-	3.2	-
			2022	-	92	52	-	3.9	4.4
	226	Wynne & Roots	2022	-	60	6	-	-	-
Wybong Road	264	Moore	2016	31	-	-	-	-	-
Additional Private Properties >25% Affected² (nb. Approx % of property area above criteria shown)									
Racecourse Road	1, 8	Drake	2011	~50%	-	-	-	-	-
	6	Scriven	2011	~50%	-	-	-	-	-
	7 ¹	Webber	2011	~50%	-	-	-	-	-
Denman Road West	203, 204	Latham	2022	-	~75%	>5	-	-	-
	241	Lane	2016	~75%	~50%	>5	-	-	-

Notes:

1 Already within a dust affectation area under existing mining approvals

2 Additional privately-owned properties where more than 25% of the land exceeds the criteria (but where any residence is not predicted to be affected)

As indicated in the above table, the project is predicted to marginally exceed the annual PM₁₀ criteria in the Racecourse Road area, and considerably exceed the 24-hour PM₁₀ criteria in the Denman Road West area, at some stage(s) during the project life.

The Department and DECCW acknowledge that the project is predicted to affect a number of properties, but also recognise that there is limited scope to reduce or mitigate these impacts further through 'traditional' mitigation measures without significantly down-scaling mining operations or sterilising significant coal resources. The affected properties are generally located within an area of intensive coal mining, being situated between the Mt Arthur mine complex and the Bengalla mine to the north.

However, the Department notes that the modelling has not taken into consideration (and is not able to using current modelling methods) a key contemporary mitigation measure that can significantly reduce the identified air quality exceedances, namely the adoption of a real-time dust management system. This uses a combination of real-time dust monitoring and weather forecasting to guide the day-to-day planning of mining operations, and prevent air quality impacts during adverse weather conditions.

Such 'active' management systems are increasingly being used in the Hunter Valley with some success, with results indicating that predicted impacts are able to be significantly reduced or eliminated.

Given the relatively significant number of privately-owned properties predicted to be affected as a result of the project, the Department believes that Mt Arthur Coal should be required to develop and implement an active dust management system for the Mt Arthur mine complex. The Department has

recommended conditions requiring this system to be developed as part of a comprehensive Air Quality Management Plan for the complex.

With such a system, the Department believes that Mt Arthur Coal should be able to avoid many or all of the predicted impacts in the Racecourse Road area, given that this area is predicted to only marginally exceed the applicable criteria. The Department also believes that the system would significantly reduce the predicted impacts in the Denman Road area, including significantly reducing the number of days that the project is predicted to exceed the 24-hour PM10 criteria.

Nevertheless, and given that the predictive modelling is not currently able to take into consideration (at least with confidence) active management measures, the Department has recommended conditions requiring Mt Arthur Coal to acquire the properties predicted to be significantly affected, at the request of the landowner.

The Department has also recommended a broad suite of other contemporary conditions to mitigate and manage air quality impacts, including requiring Mt Arthur Coal to:

- comply with contemporary air quality criteria;
- acquire any property if dust emissions exceed the applicable land acquisition criteria, if requested by the landowner;
- undertake additional dust mitigation measures (such as air filters or air conditioning) at residences predicted to be significantly or moderately affected (see above), or at any other residence if dust emissions exceed the applicable criteria, if requested by the landowner;
- develop a comprehensive Air Quality Management Plan, including a real-time dust monitoring program and an active management system which includes an early warning alert system to identify and manage potential exceedances;
- independently investigate air quality complaints and undertake applicable management measures;
- notify the affected landowners of the potential health-related impacts associated with mine dust;
- respond effectively to enquiries or complaints; and
- publicly report on its environmental performance.

The Department notes that DECCW is currently in the process of establishing a regional air quality monitoring network for the Upper Hunter Valley's coal mines. The Department's draft conditions enable the monitoring program for the project to be integrated with this wider network.

Impacts on Horse Studs

In its submission on the project Darley Australia expressed concerns about the potential dust impacts on thoroughbred horses at its Woodlands Stud, and sought commitments from Mt Arthur Coal to real-time air quality monitoring near its boundary and to funding a study into the affects of dust on equine health. The owner of the Balmoral Park stud (Drake) also raised concerns about the potential dust impacts on his horses.

The Department notes that there are no established criteria for assessing dust effects on thoroughbred horses and other livestock. In the absence of such criteria or scientific evidence that horses behave or are affected differently than humans to ambient (inert) dust, the Department considers that the human-based criteria should be used in the interim.

The project is expected to comfortably comply with amenity and health-based air quality criteria at Woodlands, and as such the Department is satisfied that the project is unlikely to adversely affect thoroughbreds at the stud (based on available scientific literature). The Department notes that since Darley's original submission, Mt Arthur Coal and Darley have reached agreement regarding air monitoring in the vicinity of Woodlands, and for ensuring that horses on Woodlands are not adversely affected by the project.

With regard to Mr Drake's Balmoral stud, as outlined above the project is predicted to exceed the annual PM10 criteria at the stud in the early years of mining (ie. before 2016), with PM10 levels above 30 $\mu\text{g}/\text{m}^3$, and up to about 50 $\mu\text{g}/\text{m}^3$, over about 50% of the property. The Department is not aware of any scientific literature that indicates that inert dust levels of this order would have a significant impact on thoroughbreds.

With the recommended real-time monitoring program and active management system described above, Mt Arthur Coal should be able to reduce many or all of these exceedances at the Balmoral

stud. Nevertheless, the Department has recommended conditions granting acquisition rights to Mr Drake, at his request.

5.2 Noise

The EA includes a noise impact assessment undertaken by specialist acoustics consultants Wilkinson Murray Pty Ltd in accordance with applicable guidelines, including the *NSW Industrial Noise Policy (INP)*, the *Environmental Criteria for Road Traffic Noise* and the *Interim Guidelines for the Assessment of Noise from Rail Infrastructure Projects*.

The assessment was undertaken with reference to sensitive receivers in the vicinity of the Mt Arthur mine, which include (see Figure 8):

- Antiene rural-residential area (Locations A and G);
- South Muswellbrook residential area (Location E);
- Racecourse Road rural-residential area (Location C); and
- Denman Road rural-residential area (Locations B, D and F).

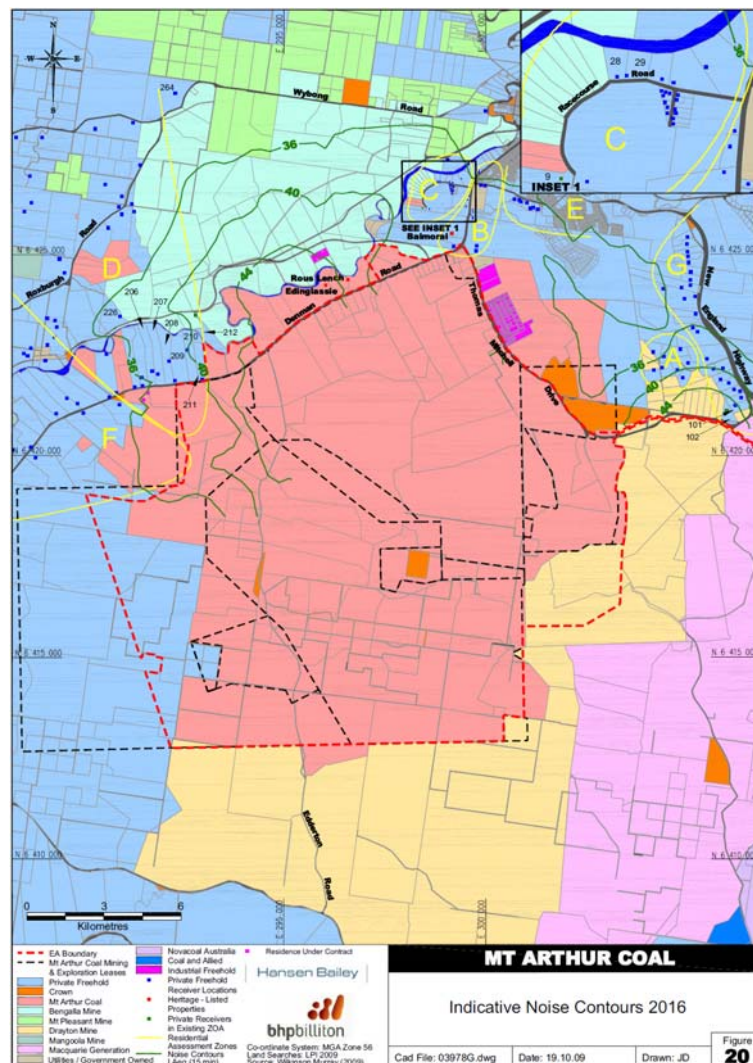


Figure 8: Sensitive Receiver Locations and Predicted Noise Contours (Year 2016)

The assessment includes a re-evaluation of background noise levels in the locality, from those used in previous noise assessments for the mine complex. This is significant in that background noise levels are used as the basis for setting some noise criteria (eg. operational 'intrusive' noise criteria are based on 'background + 5 decibels'). Therefore, any increase in assessed background noise levels would increase the noise criteria for the mine.

The re-evaluation found that background noise levels at most receivers are equivalent to the previously assessed levels. However, at two locations the assessment claims that background noise levels are higher than those used previously for the mine – namely 6 decibels higher at Racecourse

Road and 4 decibels higher at South Muswellbrook. The assessment acknowledges that background noise at Racecourse Road may be partly affected by noise from the mine itself, and therefore the assessment adopts a 4 decibel increase at this receiver.

The assessment states that the 4 decibel background noise increase at these receivers is largely due to the growth and urbanisation of Muswellbrook township, and because background noise levels at South Muswellbrook were not monitored for the original Mt Arthur North EIS and hence the most conservative (ie. lowest) background noise levels under the INP were set for this receiver in historical noise assessments (ie. 30 decibels for the day, evening and night periods).

The Department and DECCW have reviewed Mt Arthur's background noise re-evaluation in detail, and are satisfied that the revised background noise levels are technically justified and reasonable. The Department notes that the revised background noise levels are consistent with what might be expected for these receiver environments.

Operational Noise

Based on the revised background noise levels, the noise assessment predicts the noise impacts associated with the operations of the entire Mt Arthur mine complex (including train movements on the Antiene Rail Spur).

The assessment is based on the implementation of a number of reasonable and feasible mitigation measures, including:

- placement of quieter trucks on critical haul routes;
- considered alignment of haul routes;
- reduction of haul truck numbers on critical haul routes;
- adjustments to the intensity of mining in different mining areas;
- considered height of strategic dumps to provide greater noise shielding; and
- use of white noise reversing alarms.

The assessment indicates that the combined operations of the mine complex, including the proposed open cut expansion and production increase, would result in exceedances of the applicable noise criteria at most of the sensitive receiver locations, as shown in the following table. For comparative purposes, the worst case noise levels predicted in the Mt Arthur Underground (MAU) EA (ie. the last major noise assessment undertaken for the mine complex) are also included in the table.

Table 4: Predicted Noise Impacts (night time) – Mt Arthur Mine Complex (Exceedance in bold), dBA $L_{Aeq}(15\text{ min})$

Receiver Zone	Worst Case Combined Noise Level (all years)	Criterion	Worst Case Noise Level Predicted in MAU EA
A – Antiene Estate	42 (+4)	38	42
B – Denman Road East, Thomas Mitchell Drive, Skelletar Stock Route	41 (+4)	37	40
C – Racecourse Road	35	39	39
D – Denman Road North-west, Roxburgh Vineyard (north-east), Roxburgh Road	41 (+6)	35	37
E – South Muswellbrook	35	39	38
F – Denman Road West, Roxburgh Vineyard (west)	38 (+3)	35	39
G – East Antiene	48 (+9)	39	48

As illustrated above, the project would result in exceedances of the applicable noise criteria of up to 9 decibels, however the exceedances are generally similar to those predicted (and managed) under previous approvals for the Mt Arthur mine complex. The reduction in predicted noise levels at some receivers, particularly South Muswellbrook and Racecourse Road, is explained by the mitigation measures described above and the direction of future mining away from these receivers.

A summary of the total number of affected properties, and the Department's typical policy with regard to noise exceedances, is shown in the following table.

Table 5: Summary of Operational Noise Impacts

Noise Exceedance	Management generally required at this level of exceedance	No. of affected private properties (all years)
Marginally Affected Residences (1-2dB exceedance)	Noise mitigation, if possible	13
Moderately Affected Residences (3-5dB exceedance)	Noise mitigation, inc. noise mitigation at residence	14
Significantly Affected Residences (>5dB exceedance)	Acquisition	3 ¹
Significantly Affected Vacant Land (>5dB exceedance)	Acquisition	0
Total Properties Exceeding Noise Criteria		30

¹ Two of these properties are already within a noise or dust affectation area under existing mining approvals.

The assessment indicates that 13 residences would be marginally affected by noise under worst case conditions at some stage during the operation of the project. Most of these properties are located in the rural areas around Denman Road and Antiene. The Department notes that an exceedance of 1 to 2 decibels is generally not perceptible to the human ear.

Up to fourteen (14) residences would be moderately affected, which are also located in the rural areas around Denman Road and Antiene.

Three (3) residences would be significantly affected by noise under worst case conditions at some stage during the project, including the Horder and Robertson properties located adjacent to the rail spur line at East Antiene (6dB and 9dB exceedance predicted, respectively), and the Chudyk property located in the Denman Road rural area to the north-west of the mine complex (6dB exceedance predicted). The Robertson property and Chudyk property are already within noise or dust affectation areas for the Mt Arthur mine complex and Bengalla mine, respectively. The Chudyk property is also predicted to be significantly affected by dust associated with the project (see Section 5.1).

The Department is satisfied that these predicted noise impacts are not able to be readily mitigated further using traditional noise mitigation measures. However, with the implementation of a real-time monitoring and active management system, similar to that described in Section 5.1 above, the Department believes that the number of marginally, moderately and significantly affected properties should be able to be reduced considerably.

Accordingly, the Department has recommended conditions requiring Mt Arthur Coal to develop and implement such a system, as part of a comprehensive Noise Management Plan for the project.

Nevertheless, and given that the predictive modelling is not currently able to take into consideration (at least with confidence) the effectiveness of active management measures, the Department has recommended conditions requiring Mt Arthur Coal to acquire the significantly affected properties, at the request of the landowner.

The Department has also recommended a number of other conditions to consolidate and contemporise the noise management requirements for the Mt Arthur mine complex. These include requirements to:

- comply with contemporary operational noise limits;
- undertake additional noise mitigation measures (such as double glazing, insulation, and/or air conditioning) at residences predicted to be significantly or moderately affected (see above), or at any other residence if noise emissions exceed the applicable criteria by more than 2 decibels, if requested by the landowner;
- acquire any property if noise emissions exceed the applicable criteria by more than 5 decibels, if requested by the landowner;
- develop a comprehensive Noise Management Plan, including real-time noise monitoring and an active management system which includes an early warning alert system to identify and manage potential exceedances;
- independently investigate noise complaints and undertake applicable management measures; and
- communicate mining operations with the community, including publicly reporting all monitoring results, and effectively responding to enquiries and complaints.

With the implementation of these measures, the Department is satisfied that the project's noise impacts can be adequately minimised, managed, or in the case of the significantly affected properties, at least compensated.

In its submission on the project Darley Australia expressed concerns about the potential noise (and vibration) impacts on thoroughbred horses at its Woodlands Stud, and sought a commitment from Mt Arthur Coal to a 30dB(A) noise limit at the boundary of Woodlands Stud. Mt Arthur Coal has confirmed that noise levels at Woodlands would be below 35dB(A) (which is the lowest 'intrusive' noise criteria generally set under the INP), and has committed to complying with this criteria at all times. The Department is satisfied that the predicted noise (and vibration) levels at Woodlands are very low, and that at these levels the project would not have any affect on thoroughbreds (based on available literature which suggests that adverse impacts only occur at much greater noise/vibration levels).

Cumulative Noise

The EA includes a cumulative noise assessment which assesses the impact of the project together with nearby surrounding industrial sources. The assessment indicates that the cumulative noise impacts associated with the project would comply with applicable amenity criteria at all residential locations except for the Robertson property which, as discussed above, is also predicted to be significantly affected by the project itself.

To minimise and manage cumulative noise, the Department has recommended conditions requiring Mt Arthur Coal to comply with the relevant cumulative noise criteria (apart from the Robertson property for which the Department has recommended conditions requiring acquisition upon request).

Sleep Disturbance

The EA includes an assessment of the potential for sleep disturbance, associated with the mining operations (including rail transportation) in the night-time period.

The assessment indicates that the project would comply with the applicable sleep disturbance criteria at all surrounding receivers, except for the Horder and Robertson residences where train pass-by noise would exceed the sleep disturbance criteria (ie. 49 decibels) by 4 decibels and 12 decibels, respectively.

The assessment includes additional consideration of internal noise levels in relation to these predicted exceedances, which indicates that the train pass-bys are unlikely to cause significant sleep disturbance or significantly affect health and wellbeing.

Notwithstanding, as outlined above the Department has recommended conditions requiring Mt Arthur Coal to acquire the Horder and Robertson properties, upon request. The Department has also recommended conditions requiring Mt Arthur Coal to undertake additional architectural noise treatments on these properties (such as double glazing), at the landowners' request, whilst the properties remain privately-owned.

The Department has also recommended conditions requiring Mt Arthur Coal to comply with the relevant sleep disturbance criteria for all other properties.

Construction Noise

The main construction activities associated with the project would include upgrade of the existing Mt Arthur Coal Handling and Preparation Plant, modification and/or construction of other surface facilities, and relocation of the northern section of Edderton Road.

The EA includes an assessment of construction noise impacts which indicates that construction noise would comply with relevant operational noise criteria, apart from a minor 1 decibel exceedance for a short period at one residence during the relocation of Edderton Road.

The Department is satisfied that the construction noise impacts associated with the project can be managed within the context of the operational noise assessment (see above).

Road Traffic Noise

The EA includes an assessment of off-site road noise, which indicates that existing road traffic noise levels exceed applicable criteria at 7 residences on Denman Road in the 80km/h section east of Thomas Mitchell Drive. (These residences are outside the area predicted to be affected by operational or construction noise associated with the project). Whilst the project is only expected to increase these traffic noise levels by 1 decibel, the Department notes that:

- the predicted traffic noise levels at these residences (between 62 and 65 decibels) are well above the applicable traffic noise criteria (ie. 55 decibels night time and 60 decibels day-time); and
- the Mt Arthur mine complex contributes a large portion of the peak hour traffic on this section of road.

Accordingly, the Department has recommended conditions requiring Mt Arthur Coal to mitigate traffic noise impacts on these 7 residences through the implementation of architectural noise treatments on the residences, at the request of the landowner.

The Department has also recommended conditions requiring Mt Arthur Coal to implement all reasonable and feasible measures to ensure that traffic noise meets the relevant traffic noise criteria.

Off-site Rail Noise

The EA includes an assessment of off-site rail noise on the Main Northern Line. Rail noise from train movements between the mine complex and the Main Northern Line, including noise from movements on the Antiene Rail Spur, have been (conservatively) considered as part of the operational noise assessment.

The EA claims that, as the project does not seek to increase train movements above the already approved levels (ie. 24 movements a day maximum), the project would not result in any increase in rail noise levels on the Main Northern Line above those already assessed and approved.

Whilst this may be true, the Department notes that the proposed increase in production would effectively mean that the maximum approved daily train movements are reached more often, and that residents near the railway would receive less respite from train noise.

Notwithstanding, the Department accepts that the project would not significantly increase average train movements on the Main Northern Line, and hence would not significantly decrease average respite periods.

To minimise rail noise as far as practicable, the Department has recommended a condition requiring Mt Arthur Coal to investigate ways to reduce rail noise associated with the project, and to report on these investigations in the annual review of the environmental performance of the project. As outlined above, the Department has also recommended conditions requiring Mt Arthur Coal to acquire the two most affected properties (ie. Horder and Robertson, which are affected by 'on-site' rail noise on the Antiene Rail Spur), and to undertake additional architectural treatments on these and other moderately affected properties, at the landowner's request.

5.3 Blasting

The EA includes a specialist blast impact assessment for the project, undertaken by Wilkinson Murray.

Blasting has the potential to affect residents and private property in three main ways, including:

- direct risks to the safety of people and livestock;
- annoyance and discomfort, or 'amenity impact'; and
- structural damage to homes, buildings and property improvements (including heritage items).

(Dust emissions associated with blasting operations is considered separately in Section 5.1).

Safety Risks

With regard to direct safety risks, the Department notes that all private properties are over 500 metres from the mining area (the closest is the Scriven property, approximately 1,300 metres from the proposed expansion area), and therefore have a low risk of being affected by flyrock (ie. rock projectiles). However, Denman Road is within 500 metres of blasting operations, and Mt Arthur Coal

proposes to manage associated risks by temporarily closing the road during blast events within 500 metres of the road.

The Department accepts that the temporary closure of Denman Road (approximately 15 minutes per blast event) is manageable, and has recommended a condition requiring Mt Arthur Coal to prepare a Road Closure Management Plan for the project. The plan would be required to include measures to limit closures, avoid peak traffic periods as far as practicable, and coordinate with neighbouring mines to manage cumulative effects, to minimise inconvenience on Denman Road.

Amenity and Structural Damage

With regard to amenity and structural impacts, the relevant blast criteria are presented in the following table. (Impacts to heritage structures is discussed under a separate heading below).

Table 6: Blast Criteria

Blast Impact	Amenity Criteria*	Structural Damage Criteria**
Airblast Overpressure	115 dB for 95% of blasts in any year 120 dB for 100% of blasts	133 dB
Ground Vibration	5 mm/sec for 95% of blasts in any year 10 mm/sec for 100% of blasts	10 mm/sec

* ANZECC Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration

** Australian Standard AS2187.2-2006 Explosives – Storage, Transport and Use (houses and low-rise residential buildings).

The blast assessment indicates that, without any mitigation measures, blasting in the northern area of the proposed expansion area using the mean Maximum Instantaneous Charge (MIC) size of 1,375 kilograms¹ would exceed the applicable amenity-based overpressure criteria (ie. 115 decibels) at up to 6 private properties directly to the north of the mine, including:

- Property 6 (Scriven), which is the closest property with a predicted 95th percentile blast overpressure of 118 decibels;
- Property 9 (Englebrecht);
- Property 10 (Muswellbrook Race Club);
- Property 49 (Webber) (two residences); and
- Property 211 (Rankin).

With regard to the vibration criteria, the assessment indicates that blasting would comply with the relevant amenity-based and structural damage-based ground vibration criteria at all private properties (worst case prediction at the Scriven residence is 2.1 mm/sec for a 1,375 kilogram blast).

To mitigate the amenity-related overpressure exceedances, Mt Arthur Coal proposes to manage the explosive size (i.e. the MIC), and/or adopt other measures (such as controlled electronic detonation and possibly restriction of blasting under certain meteorological conditions), to ensure compliance with all applicable amenity and structural damage criteria at all times. The area of mining for which such blast controls would be required (for blasting of 1,681 kilograms or above) is shown on Figure 9.

Mt Arthur Coal notes that, assuming the adoption of existing blasting techniques, the blast size would need to be restricted to 300 kilograms MIC to meet the 115 decibel overpressure criterion when blasting at the closest point to the nearest receiver (ie. Scriven). In reality, Mt Arthur Coal would implement a range of measures in conjunction with reduced MIC size to mitigate blast impacts.

The Department accepts that blasting operations can feasibly be managed to meet the applicable criteria by reducing MICs and applying other blast management techniques and that, subject to strict blast management conditions (including restrictions on blasting frequency), blasting can be managed such that the operations would not significantly affect surrounding landowners. To ensure this occurs, the Department has recommended conditions requiring Mt Arthur Coal to:

- restrict all blasting within the shaded area shown on Figure 9 until Mt Arthur Coal can demonstrate, to the satisfaction of the Director-General, that blasting operations will meet the relevant criteria;
- manage blasting operations to comply with all relevant criteria at private properties;
- limit blast frequency (and hours);
- keep residences notified and up to date regarding blasting operations, and facilitate feedback/complaint management;

¹ This is the mean MIC used for blasting at Mt Arthur North.

- provide for structural property inspections and investigations upon request; and
- develop a comprehensive blast management plan.

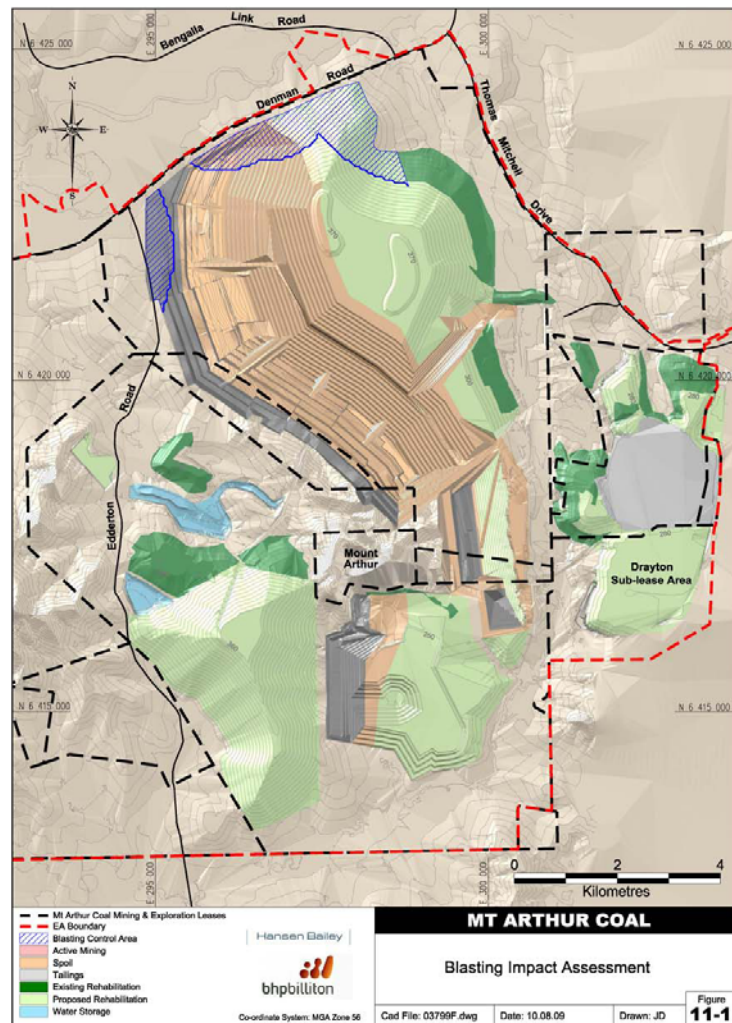


Figure 9: Area Subject to Additional Blast Controls (hatched)

Heritage Structures

There are a number of potentially susceptible heritage items in the vicinity of the mine complex that may be affected by blasting operations, including:

- Edinglassie and Rous Lench homesteads (both of which are owned by Mt Arthur Coal), located approximately 600 metres to the north of proposed blasting operations;
- Balmoral homestead, located approximately 1.5 kilometres to the north of the proposed expansion area, which is privately-owned (Drake); and
- 3 significant Aboriginal axe grinding grooves located adjacent the mining areas.

The Department notes that the owner of Balmoral, Mr Drake, has raised significant concerns about blast-related impacts on his property in his submission on the project and in representations in the past. A structural assessment of Mr Drake's property is currently underway under the existing approval for the mine complex.

The blast assessment (and additional information provided by Mt Arthur Coal) indicates that, without any mitigation measures, blasting in the northern area of the proposed expansion area using a mean Maximum Instantaneous Charge (MIC) size of 1,375 kilograms would exceed the applicable structural damage criteria (ie. 10 mm/sec) at Edinglassie and Rous Lench, with vibration levels of up to 19 mm/sec experienced.

At Balmoral, the assessment indicates that the worst case vibration level would be 5.6 mm/sec, which is comfortably below the applicable criteria.

Mt Arthur Coal proposes to manage blast size and/or implement other blast techniques to ensure compliance with the applicable vibration criteria for heritage structures at all times. The area of mining for which such blast controls would be required (for blasting of 1,681 kilograms or above) is included on Figure 9.

Mt Arthur Coal notes that, assuming the adoption of existing blasting techniques, the blast size would need to be restricted to as low as 560 kilograms MIC to meet the 10 mm/sec vibration criterion when blasting at the closest point to the nearest receiver (ie. Rous Lench).

The Department is satisfied that, as with private properties, blasting operations can be feasibly managed to ensure compliance with blast criteria at the heritage items. The Department's recommended blast-related conditions outlined above, along with requirements to comply with relevant blast criteria for heritage structures, to develop a protocol for evaluating blast-related impacts on heritage items, and to develop a Heritage Management Plan that includes consideration of blast-related impacts, would ensure that blasting operations are appropriately managed to protect heritage structures in the vicinity.

The Department acknowledges Mr Drake's ongoing concerns regarding blast-related impacts at Balmoral, but is satisfied that Mt Arthur Coal's assessment indicates that the project blasting can be suitably managed to avoid any damage to this heritage item. Notwithstanding, the Department notes that the recommended conditions provide for independent property investigations to be undertaken in the event that Mr Drake or any other landowner feels his or her property is being adversely impacted by project blasting.

With regard to the Aboriginal axe grinding grooves (see Section 5.7 for further detail), Mt Arthur Coal has provided additional specialist information that indicates that the grooves would not be affected by project blasting. Notwithstanding, the Department has recommended conditions requiring Mt Arthur Coal to monitor and manage potential blast-related impacts on the axe grinding grooves.

5.4 Greenhouse Gas Emissions

The EA includes a Greenhouse Gas and Energy Assessment, undertaken by PAE Holmes. The assessment was undertaken in accordance with applicable GHG guidelines, including the Commonwealth Department of Climate Change's *National Greenhouse Accounts Factors, November 2008*.

The assessment calculates direct and indirect GHG emissions associated with the project, including 'Scope 1' emissions (ie. direct GHG emissions from sources controlled by Mt Arthur Coal), 'Scope 2' emissions (ie. indirect emissions associated with the import of electricity) and 'Scope 3' emissions (ie. other indirect emissions, such as those associated with the downstream combustion of the coal).

The calculated GHG emissions associated with the project are presented in the following table.

Table 7: Project Direct and Indirect GHG Emissions

Scope	GHG source(s)	Total project GHG emissions (tonnes carbon dioxide equivalent, TCO ₂ e)
Scope 1	Mining and extraction related	23,780,000
Scope 2	Upstream electricity	790,000
Scope 3	Downstream transport of product coal	11,560,000
	Downstream coal use	928,610,000
Total (exc. downstream coal use)		36,130,000
Total (inc. downstream coal use)		964,740,000
Average Annual GHG Emissions		74,240,000

The assessment indicates that 96% of the total GHG emissions generated as a consequence of the project are those associated with the downstream burning of the product coal at power stations – ie. Scope 3 indirect emissions.

The average annual GHG emissions arising as a consequence of the project (ie. including coal combustion) represents approximately 0.17% of annual global GHG emissions, or 0.0024% of the total global GHG load. The EA indicates that the project's contribution to increased global temperatures would be negligible at around 0.00006 degrees.

The Department acknowledges the threat posed by global warming/climate change, but does not believe that this threat should necessarily preclude the approval of this project.

Rather, the consideration of the project application with regard to GHG impacts needs to be balanced with consideration to:

- the project's contribution to global warming/climate change;
- whether refusing the project application would reduce global GHG emissions;
- the need for the project;
- the benefits of the project, including job creation and its contribution to the NSW economy;
- the objects of the EP&A Act, including the encouragement of ESD; and
- available GHG impact mitigation measures.

The project's contribution to global warming/climate change is discussed above. Following this consideration, the Department is satisfied that the project's contribution to global GHG emissions, even when assessed on a full life cycle basis (ie. including downstream GHG emissions), would be very small.

It must be noted that if the project was not allowed to proceed, the resultant gap in the coal supply would be almost certainly filled by another coal resource either in NSW, Australia or overseas. In other words, removing the GHG emissions from the project would not likely result in any decrease in global CO₂ emissions.

The need for the project is discussed in Section 5.11. Based on its consideration, the Department is satisfied that there is a clear need for the development of new coal deposits, for at least the foreseeable future, to meet society's basic energy needs.

The benefits of the project are also summarised in Section 5.11. Following its consideration, the Department is satisfied that the project would have considerable socio-economic benefits, and that it represents a logical extension to, and consolidation of, Mt Arthur Coal's existing mining operations.

The objects of the EP&A Act are outlined in Section 3.6, and these objects have informed the Department's assessment of the project. With regard to the principles of ESD, the Department acknowledges that global warming/climate change presents a clear threat of serious or irreversible environmental damage, as well as a threat to intergenerational equity and a threat to the conservation of biological diversity. However, the Department is satisfied that the project itself does not present such a threat (as the emissions from the project itself are minor), and it must also be acknowledged that the downstream energy and other socio-economic benefits generated by the project would also benefit future generations, particularly through the shoring up of national and international energy needs.

With regard to GHG impact mitigation measures, the Department acknowledges that Mt Arthur Coal is already required under existing approvals to implement a comprehensive energy savings plan for the mine complex, including requirements to seek to continually improve energy efficiency. The Department has recommended conditions maintaining these management measures.

The Department does not believe it is reasonable to apply other requirements on Mt Arthur Coal through the NSW planning system to significantly reduce GHG emissions, including Scope 3 emissions associated with the downstream burning of the product coal. Any such impost – for example a CO₂ levy on product coal – would unfairly penalise Mt Arthur Coal and its ability to compete in the energy industry. The Department believes that such an ad hoc approach to the issue of global warming/climate change is not in the public interest. The Department is satisfied that much more effective measures have been, and are continuing to be, planned and implemented at the State, national and international levels to combat global warming/climate change.

5.5 Surface Water and Groundwater

The project has the potential to affect surface water and groundwater resources in a number of ways, including:

- altering the water balance for the Mt Arthur mine;
- affecting surface water flows and quality in local and regional catchments, and water availability to downstream water users;
- affecting groundwater flows and quality in sub-surface aquifers, and water availability to local groundwater users; and

- affecting flood behaviour.

The EA includes specialist surface water and groundwater impact assessments, undertaken by Gilbert & Associates, and Australasian Groundwater and Environmental Consultants, respectively. The assessments include consideration of baseline water flow and quality conditions, and modelling to assess the impacts of the project on water quality and flows.

Water Balance

Water balance modelling indicates that the project would increase the water demand at the mine complex by about 7,060 ML/year, to a total of about 12,320 ML/year (an increase of 180%). The key water demands are associated with (in decreasing order):

- coal handling and processing (washing);
- evaporation;
- dust suppression;
- underground mining; and
- other potable and non-potable uses.

The water required for the project would be sourced from a number of existing available supplies, including (approximate % contribution in brackets):

- surface water runoff from disturbed areas of the site, as collected in the mine's dirty water management system, and harvestable rights (50%);
- Hunter River licensed extraction (17%);
- groundwater inflows (13%);
- recycled tailings water (12%); and
- treated effluent from Muswellbrook Shire Council (8%).

The water balance includes modelling for dry, median and wet rainfall years based on these supplies. The modelling indicates that the mine complex, including the underground project, would vary between a net water deficit of 499 ML/yr for a dry year and net water surplus of 122 ML/yr for a wet year.

The assessment indicates that the mine complex currently has approximately 5,500 ML held in water storages, and a total water storage capacity of 13,500 ML. Therefore, the mine complex has the ability to reasonably accommodate fluctuations in water demand. Modelling indicates that the project would have an average water supply reliability of more than 90%.

During periods of significant water deficit when storages need recharging, Mt Arthur Coal notes that it has access to a number of external water supplies, including water access licences on the Hunter Regulated River Water Source, treated effluent from Muswellbrook Shire Council, and recycled water from neighbouring industrial sources (eg. mine water from Drayton Mine).

The Department and NOW are satisfied that these existing water sources should satisfy the water demands of the project (based on historical data), that the project would not have a significant impact on water availability and water sharing in the locality, and that the project water supply is able to be managed in a manner that is consistent with the water market established under the *Water Management Act 2000*.

The Department notes that Darley Australia (owner of Woodlands Stud) sought a commitment from Mt Arthur Coal that it would not seek additional water rights during periods of water deficit except in the event of a 1 in 50 year or greater severity drought. The Department does not believe that such a request is consistent with the open water market established under the Water Management Act, and is satisfied that Mt Arthur Coal's water balance modeling indicates that it would not require significant surplus water during periods of water deficit.

During periods of water surplus, Mt Arthur Coal proposes to store the excess mine water in on-site storages, and/or discharge it in accordance with the rules of the Hunter River Salinity Trading Scheme. The Department is satisfied that Mt Arthur Coal is able to comply with the rules of the Scheme, in the event that discharges are required.

Surface Water

The Mt Arthur mine complex sits within the catchments of a number of local ephemeral (ie. flow intermittently) creeks, all of which ultimately drain to the Hunter River. The northern and western areas of the mine complex generally drain northward to the Hunter River via a number of small creeks including Quarry Creek, Fairford Creek, Whites Creek (and the Whites Creek diversion) and other unnamed creeks. The southern and eastern areas of the complex drain southward to Saddlers Creek, which flows to the south-west joining the Hunter River downstream of Denman (see Figure 10).

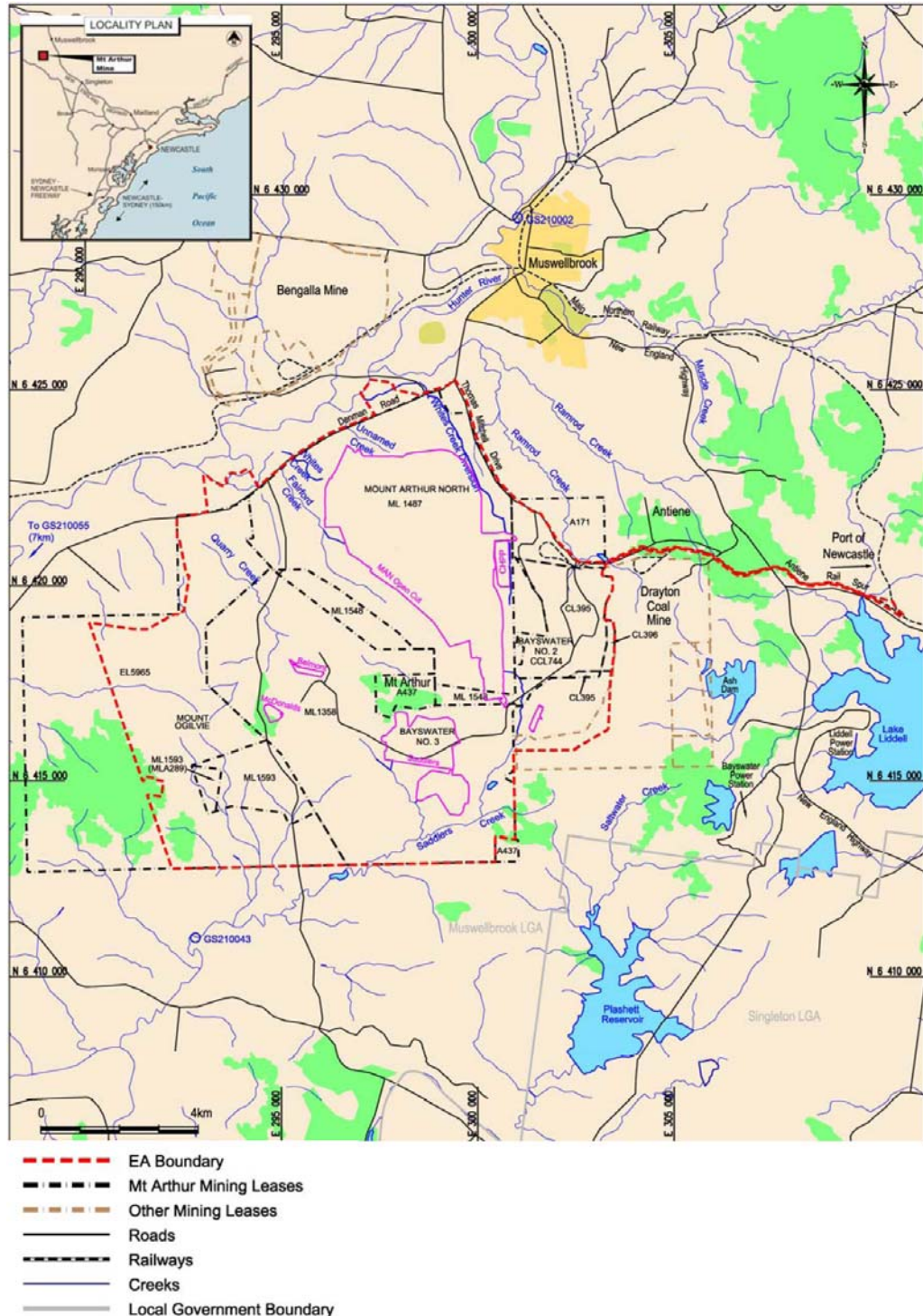


Figure 10: Surface water catchments

All of these local creeks have been affected by existing approved mining operations of the mine complex to varying degrees. A comparison of the changes in catchment size as a result of existing operations, and as a result of the proposed expansion, is presented in the following table.

Table 8: Local Creek Catchment Changes

Catchment	Catchment Area (km ²)			
	Before Mining	Current	Proposed Project	Final Landform
Quarry Creek	22.0	19.0	18.6	21.7
Fairford Creek	10.8	10.8	2.7	5.8
Whites Creek	21.5	2.2	2.2	3.2
Whites Creek Diversion	n/a	4.9	6.3	17.2
Unnamed Creeks	4.2	5.0	2.8	3.7
Saddlers Creek	99.0	93.7	88.1	93.5

As indicated in the table, the project would affect the catchment area, and hence catchment flows in most of the local creeks, with Fairford Creek experiencing probably the most significant change from existing approved operations.

Given the ephemeral nature of the affected creeks, and that the majority of the land downstream of these catchments is owned by Mt Arthur Coal or Drayton Coal (including all of the land within the Fairford Creek catchment), the Department is satisfied that any flow reductions in these catchments is unlikely to result in any significant impacts to downstream surface water users or the environment.

On a regional scale, the project would reduce the Hunter River catchment area by some 0.81% at the maximum extent of mining, and 0.27% at the end of mining (ie. final landform), which is not considered to be significant.

Notwithstanding, NOW and the Department believe that Mt Arthur Coal should be required to comprehensively monitor stream flows, and provide compensatory water supplies to any downstream surface water user that experiences loss of surface water flows as a result of the project.

With regard to surface water quality, the Department is satisfied that, subject to the implementation of standard best practice water management practices, the project can be managed in a manner which would not significantly affect local and regional water quality, including in Saddlers Creek and the Hunter River. The Department has recommended conditions requiring Mt Arthur Coal to prepare a new, comprehensive Water Management Plan for the mine complex, including a program to monitor surface water quality against contemporary surface water and stream health impact assessment criteria.

Flooding

The north-western section of the proposed open cut expansion area, adjacent to Denman Road, is in a low-lying area and could be affected by flooding from the Hunter River in large flood events. To prevent floodwaters entering the pit, Mt Arthur Coal proposes to construct a bund in this location above the 1 in 100 year flood level (plus adequate freeboard). The surface water assessment indicates that such a bund would have a negligible effect on the flood storage capacity of the Hunter River floodplain, or on local flood behaviour.

The Department is satisfied that the project is unlikely to result in any significant changes to flood behaviour in the locality, but believes that Mt Arthur Coal should be required to manage local flooding effects (including construction of flood bunds) as part of its detailed Water Management Plan. The Department has recommended conditions in this regard.

Groundwater

The groundwater impact assessment indicates that there are 3 key aquifer systems in the area, including aquifers associated with:

- the coal measures;
- the regolith (soils and weathered bedrock) near the ground surface; and
- alluvial sediments associated with the Hunter River and Saddlers Creek, and their tributaries.

Groundwater quality within the coal measures is generally brackish to saline, while groundwater quality in the regolith and alluvials is variable from fresh to saline.

Private groundwater bores in the locality are mostly concentrated on the alluvial lands of the Hunter River to the west and north of the project area, although there are a small number of bores drawing water from the regolith and coal measures in the area.

The Mt Arthur mine complex already affects the regional groundwater system, largely through intercepting (and depressurising) the coal seam aquifers, which results in a drawdown of regional groundwater levels, which in turn affects groundwater flows in the near surface regolith and alluvial aquifers. Under existing approvals for the mine complex, the predicted drawdown extends below Saddlers Creek and its alluvials, but does not significantly encroach below the Hunter River or its extensive alluvial lands.

The project would increase the regional drawdown surrounding the mine, and importantly, extend this drawdown below the Hunter River alluvials (see Figure 11). Mining itself is proposed to encroach upon the Hunter River alluvials (those derived from Whites Creek, a tributary of the Hunter River), in the north-western corner of the proposed expansion area (see Figure 12), as well as the Saddlers Creek alluvials in the southern area of the mine complex (although this encroachment has been approved under existing approvals).

To mitigate direct impacts of mining encroaching on the alluvials, Mt Arthur Coal has committed to not mining within 150 metres² of the Hunter River alluvials unless agreement has been reached with NOW regarding the installation of a lower permeability barrier along the point of connections of mining and the alluvium (or other appropriate safeguards).

NOW accepts this precautionary 150 metre setback, but notes that such a buffer would not avoid all interactions between mining and the alluvium.

Indeed, the groundwater impact assessment indicates that the regional drawdown would affect flows within the alluvium. At present, approximately 0.2ML/day flows from the coal measure aquifers to the Hunter River alluvials within the mine boundary. These flows are expected to reverse during the life of the project, with current flows ceasing by mid 2011 and then reversing to about 0.74ML/day from the alluvials toward the open cut pit at 2022. The Hunter River alluvial aquifer is predicted to be impacted over a length of approximately 6 kilometres, or about 4.2 km², which represents about 4% of the Hunter River alluvium. The lower permeability barrier described above would reduce this impact.

² This setback is recommended in NOW's *Management of Stream/Aquifer Systems in Coal Mining Developments, Hunter Region* (April 2005) guidelines.

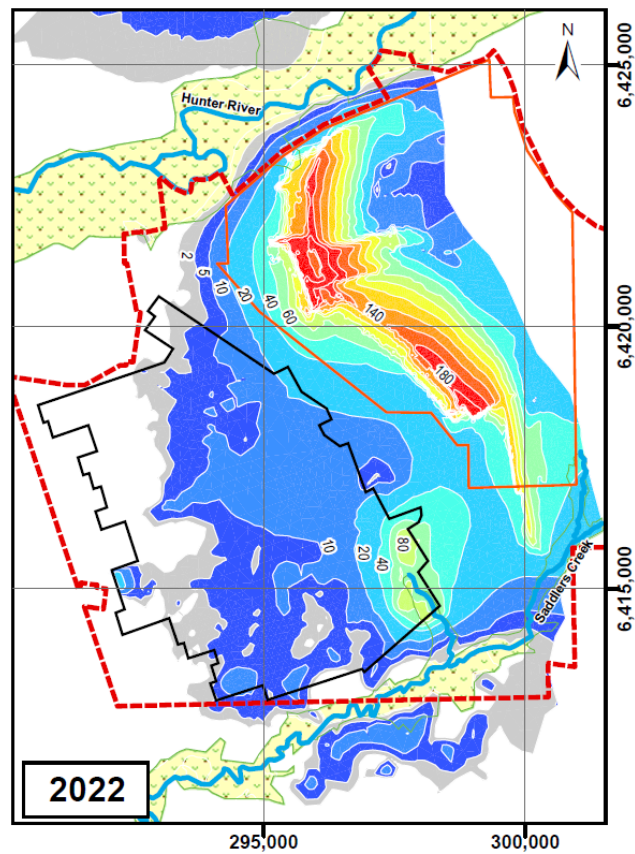


Figure 11: Predicted Groundwater Drawdown (Year 2022)

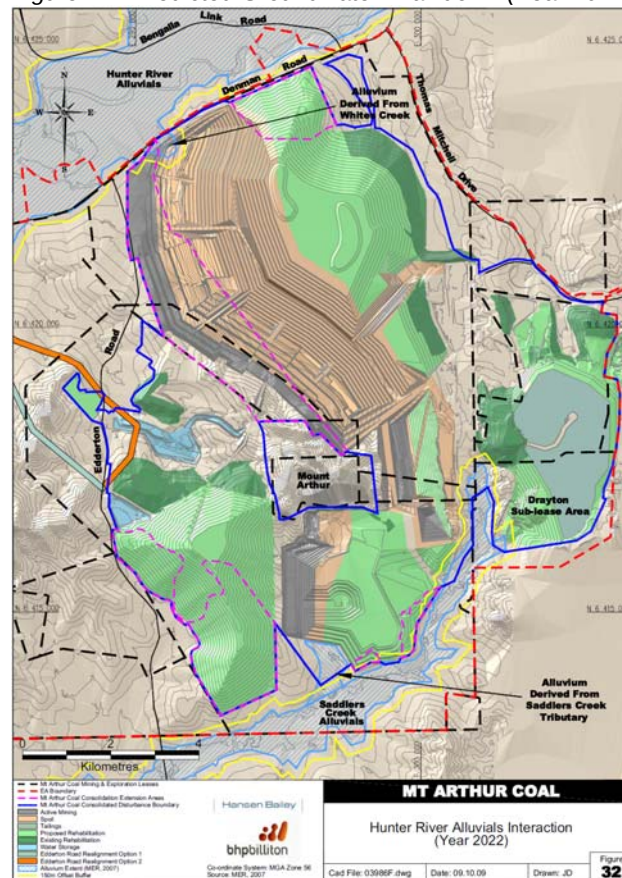


Figure 12: Interaction of Mining with Alluvials

Similarly, flows in the Saddlers Creek alluvium are also predicted to reverse, with flow from the alluvium into the coal seam aquifer (and toward the open cut pit) stabilising at about 0.09 ML/day by 2019.

The EA notes that there are no privately-owned groundwater bores within the area of affected alluvials, and that no other privately-owned bores within the wider regional drawdown area would be significantly affected by the proposed expansion.

Following the completion of mining, groundwater levels and pressures within the depressurised area would gradually recover, however the Mt Arthur voids would act as a permanent groundwater sink.

NOW does not object to the groundwater impacts of the project, but notes that all groundwater (and surface water) loss caused by the project must be appropriately accounted for (and licenced) in accordance with the rules of the relevant water sharing plans – including the Hunter Regulated River Water Sharing Plan (HRRWSP) and Hunter Unregulated River and Alluvial Water Sharing Plan (HURAWSP). In this regard, NOW recommended conditions requiring Mt Arthur Coal to:

- account for all losses to the groundwater system;
- verify modelling predictions (including annual reporting and periodic audits) and develop triggers for investigation and mitigation;
- develop mechanisms to isolate the alluvial groundwater system as required; and
- offset permanent alluvial groundwater losses through purchasing (and retiring) licence entitlements from mining operations.

The Department is satisfied with the groundwater impact assessment provided in the EA. Based on this assessment the Department believes that, whilst the project would result in relatively significant additional regional depressurisation of the groundwater resource, this depressurisation is unlikely to affect a significant number of groundwater users, is unlikely to significantly decrease surface water flows in the Hunter River and Saddlers Creek, or result in a significant environmental impact.

The Department has recommended conditions consistent with those recommended by NOW, including requirements to:

- restrict mining within 150 metres from the Hunter River and Saddlers Creek alluvials, unless appropriate groundwater management safeguards are in place to the satisfaction of NOW;
- provide compensatory water supplies to any landowner whose supplies are adversely affected by the project;
- prepare and implement a detailed Groundwater Monitoring Program, including agreed impact assessment criteria; and
- prepare, and if necessary implement, a Surface and Ground Water Response Plan for managing identified exceedances of impact assessment criteria and providing compensatory water supplies.

Conclusion

The Department is satisfied that Mt Arthur Coal has adequately assessed the project's potential impacts to surface water and groundwater resources.

Following its assessment, the Department is satisfied that the project can be managed such that it would not have a significant impact on water resources. The Department has recommended conditions that require Mt Arthur Coal to revise its existing water management plans and monitoring programs for the Mt Arthur mine complex, in consultation with NOW and DECCW. In particular, the water management plans would be required to include:

- a Site Water Balance;
- an Erosion and Sediment Control Plan;
- a Surface Water Monitoring Plan;
- a Groundwater Monitoring Plan; and
- a Surface and Ground Water Response Plan.

5.6 Flora and Fauna

The project would disturb a total of 1,078 hectares of land in addition to the current approved mine footprint, including:

- 240 hectares of native woodland;
- 750 hectares of native understorey/grassland; and
- 88 hectares of exotic grassland.

The EA includes a flora and fauna assessment undertaken by Cumberland Ecology. The assessment draws on the historical studies undertaken for the mine complex, and additional field flora surveys of the proposed mine extension areas from Spring 2008 to Autumn 2009.

Flora

Much of the vegetation proposed to be cleared for the project comprises endangered ecological communities (EECs) listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act). A summary of the vegetation communities to be disturbed is presented in the following table.

Table 9: Impacts on Vegetation Communities

Community	Area to be Cleared (ha)	Conservation Significance
Native Woodland		
Spotted Gum Forest	0.90	-
Central Hunter Box – Ironbark Woodland	2.00	Preliminary listed EEC
Hunter Floodplain Red Gum Woodland	0.66	-
Narrabeen Foothills Slaty Box Woodland	24.21	Preliminary listed EEC
Upper Hunter Hills Exposed – Ironbark Woodland	38.20	-
Upper Hunter White Box – Ironbark Grassy Woodland	116.45	EEC
Central Hunter Bullock Forest Regeneration	58.14	-
Sub-total	240.56	
Understorey		
Box – Ironbark Understorey	6.10	-
Slaty Box Derived Understorey	43.70	-
White Box – Ironbark Derived Understorey	699.54	EEC
Sub-total	749.34	
Other		
Exotic Grassland	88.18	None
Total	1,078.08	

It is noted that the proposed mine plan has been modified slightly to avoid impacting a small area of critically endangered Hunter Floodplain Red Gum Woodland. Mt Arthur Coal believes that further changes to avoid EECs would not be reasonable.

It is also noted that, although the project would disturb a very large area (ie. 842.2 hectares) of EEC or preliminary listed EEC, a significant portion of this area (ie. 699.54 hectares) is degraded understorey (also known as 'derived grassland'), comprising grazing land with only some understorey components of the EEC remaining.

Notwithstanding, the flora and fauna assessment concludes that, without any mitigation or offsetting measures, the project would have a significant impact on the EECs.

The Department acknowledges that the project would remove a considerable area of either intact, or degraded EEC. Consequently, the Department and the DECCW agree that, for the project to be able to meet the general principle of 'improving or maintaining' biodiversity values over the medium to long term, it would require significant vegetation offsets of suitable size and quality. This issue is discussed under a separate sub-heading below.

In addition to the EECs, the project would disturb 2 threatened flora species, including the Lobed Bluegrass (*Bothriochloa biloba*) listed as vulnerable under the EPBC Act, and the Tiger Orchid (*Cymbidium canaliculatum*) listed as vulnerable and endangered under the EPBC Act and TSC Act, respectively. Given the existing populations of these species within the area, and with the proposed relocation of the identified Tiger Orchid to the existing Saddlers Creek Offset Area, the assessment concludes that the project would not have a significant impact on these species.

DECCW and the Department do not object to this conclusion, although DECCW queried the potential for disturbance of an additional species – Weeping Myall – associated with the relocation of Edderton Road. Mt Arthur Coal subsequently confirmed that the subject population of Weeping Myall would not be disturbed, and that it would fence the known population to ensure that it is not disturbed.

Fauna

A total of 21 threatened fauna species have been identified, or have the potential to occur, within the study area, including:

- 9 birds;
- 9 bats; and
- 3 mammals (Squirrel Glider, Parma Wallaby and Spotted-tailed Quoll).

Tests of ecological significance undertaken for these species indicate that the project – without any impact mitigation or offsetting – would have a moderate to significant impact on a number of these species, primarily due to loss of forest habitat.

To minimise the impacts on fauna, Mt Arthur Coal proposes to implement a range of standard management strategies including progressive clearing, pre-clearance surveys and habitat augmentation, which would complement the implementation of the biodiversity offset strategy (as discussed below).

Biodiversity Offset and Rehabilitation Strategy

The EA includes a rehabilitation strategy and a biodiversity offset strategy which outline the strategies to progressively rehabilitate the site and to compensate for the 240 hectares of native woodland and 842 hectares of EEC or preliminary-listed EEC which would be cleared as a result of the project.

The offset strategy and rehabilitation strategy also seeks to consolidate the existing offsets and rehabilitation strategies for the mine complex. For the purposes of this assessment, the Department has concentrated on the additional offsets required and provided as a result of the project.

In this regard, the EA proposed 3 key new offset areas, including:

- a 495 hectare area on the northern side of Thomas Mitchell Drive (referred to as the Thomas Mitchell Drive Offset Area);
- a 222 hectare area on the southern side of Thomas Mitchell Drive within the mine complex site (referred to as the Onsite Offset Area); and
- a 500 hectare area within the mine rehabilitation area (referred to as the Proposed Regenerated Woodland).

DECCW and the Department considered these offsets to be inadequate to compensate for the biodiversity impacts of the project. Subsequently, Mt Arthur Coal revised its offset strategy (twice) to include an additional:

- 110 hectare parcel of land on Roxburgh Road (referred to as the Constable Offset Area); and
- 165 hectare parcel of land adjacent to the proposed Thomas Mitchell Drive Offsite Offset Area (Mt Arthur Coal does not own this land, but has obtained an option to acquire the property – the exact boundaries of the area are yet to be confirmed)³.

The revised offset strategy is shown on Figure 13, and a (simplistic) summary of the strategy is presented in the following table.

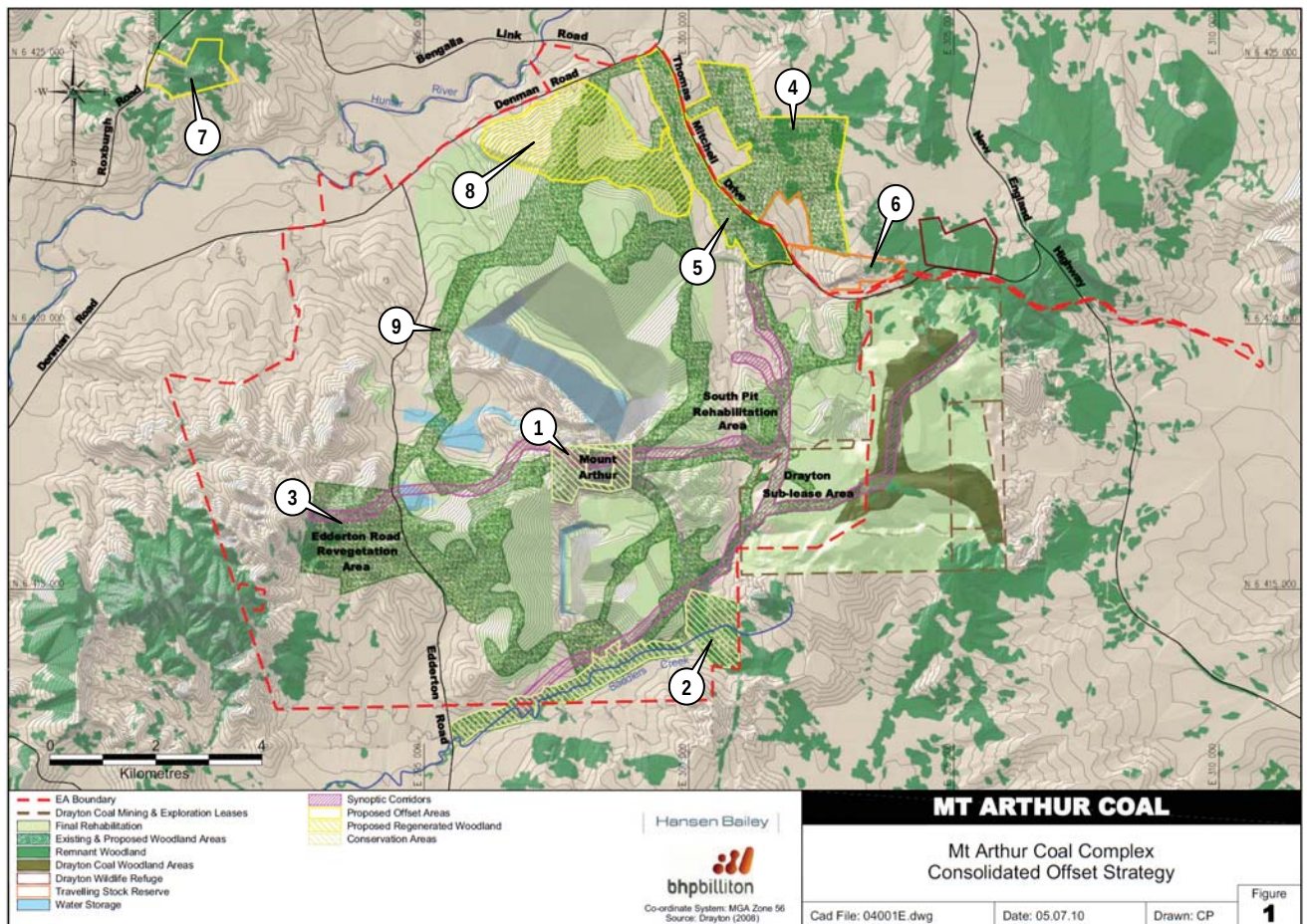
Table 10: Revised Offset Strategy

Native Vegetation Type	Cleared Area (ha)	Total Offset Area (ha)	Offset Ratio
All Woodland	240	992 ²	4:1
EEC ¹ Woodland	143		7:1
EEC ¹ Woodland and Understorey	842		1.2:1

1 Including Preliminary listed EEC

2 Excluding the Proposed Regenerated Woodland in the mine rehabilitation area, see discussion below.

³ The Department notes that DECCW has not provided its full support for the expanded offset yet, partly because detailed ecological information on the additional offset area has not been provided at this stage. The Department has recommended conditions requiring Mt Arthur Coal to confirm details of the additional offset area, in consultation with DECCW.



- Key:
- 1 Mt Arthur Conservation Area (existing offset area under MAN approval)
 - 2 Saddlers Creek Conservation Area (under MAU approval)
 - 3 Edderton Road Revegetation Area (under MAU approval)
 - 4 Thomas Mitchell Drive Offsite Offset Area
 - 5 Thomas Mitchell Drive Onsite Offset Area
 - 6 Additional Thomas Mitchell Drive Offsite Offset Area (exact area to be confirmed)
 - 7 Roxburgh Road 'Constable' Offset Area
 - 8 Proposed Regenerated Woodland
 - 9 Mine Rehabilitation Woodland

Figure 13: Offset Strategy

In considering the adequacy of the proposed offset strategy, the Department has discounted the proposed 500 hectare Proposed Regenerated Woodland in the mine rehabilitation area, given;

- the long timeframe associated with the rehabilitation works;
- the inherent risks associated with re-establishment of high-quality, diverse ecosystems on the rehabilitated landscapes; and
- the high significance of the vegetation that would be removed by the project.

Notwithstanding, rehabilitation of the project disturbance area would ultimately become an important component of the total long term vegetation offset strategy for the project. In this regard, the Department notes that the existing approval for the Mt Arthur North mine includes a condition requiring Mt Arthur Coal to rehabilitate at least 30% of the mined area to bushland. The Department has recommended a condition continuing this requirement for the project.

In total, the project would ultimately provide for the establishment and conservation of around 3,012 hectares of native woodland vegetation, or 3,460 hectares including the contribution from the Mt Arthur Underground Project. These areas include:

- the 992 hectares of offsets proposed under this project;
- the 105 hectare existing Mt Arthur Conservation Area, required under the Mt Arthur North open cut consent;
- the 295 hectare Saddlers Creek Conservation Area, required under the Mt Arthur Underground project;

- the 154 hectare Edderton Road Revegetation Area, required under the Mt Arthur Underground project; and
- the 1,915 hectares of disturbance area, required to be rehabilitated to bushland under this project.

The Department has recommended conditions requiring revegetation in these areas to be focused on the re-establishment of significant and/or threatened plant communities, species and habitat for threatened fauna species.

Conclusion

The Department acknowledges that the project would require the clearing of a large area of good quality vegetation, including 240 hectares of native trees and 842 hectares of EEC (comprising trees and grassland).

However, the Department is satisfied that these impacts are able to be mitigated and/or offset to ensure that biodiversity values are maintained and potentially improved over the medium to long term. To achieve this goal, the Department has recommended conditions requiring Mt Arthur Coal to:

- implement the offset strategy (including determining the final offsets in consultation with DECCW);
- develop a comprehensive Biodiversity Management Plan to provide for the detailed implementation of the offset strategy;
- provide for the long term conservation (ie. in perpetuity) of the offset areas;
- lodge a substantial conservation and biodiversity bond to ensure that the offset areas are established and maintained to the satisfaction of the Director-General; and
- develop a detailed Rehabilitation Strategy and Rehabilitation Management Plan in accordance with I&I NSW guidelines.

The Department notes that the implementation of the recommended offset strategy and proposed rehabilitation of the project disturbance area would ultimately provide for the establishment and long term conservation of 3,460 hectares of trees to compensate for the vegetation removed by the mine complex.

5.7 Aboriginal Heritage

The EA includes a specialist Aboriginal cultural heritage assessment, undertaken by AECOM in consultation with local Aboriginal groups. The assessment draws on previous archaeological assessments for the mine complex, and includes additional surveys of areas not previously surveyed.

The surveys identified that a total of 102 Aboriginal 'sites' would be directly impacted by the proposed mine extension, with many of these sites identified in previous surveys according to archaeological terrain units. Areas within these 'sites' in which artefacts have been located have been referred to as site 'loci'. At least 355 loci have been identified within these 102 sites.

All of the sites to be impacted comprise open camp sites, including artefact scatters and isolated finds, ranging in significance from low to high. The proposed extension has been modified to avoid impacting 2 highly significant axe grinding groove sites – and a third grinding groove site is located in the Mt Arthur Conservation Area.

The proposed expansion involves mining through the 3 Heritage Management Zones (HMZs) established under the original approval for the Mt Arthur North mine (see Figure 3). The HMZs (which total 408 hectares in area) were established as an offset for the Aboriginal heritage impacts associated with the mine. The EA notes that some 45 aboriginal sites occur either wholly or partially within these HMZs.

To offset the proposed impacts on the HMZs, Mt Arthur Coal proposes to establish a new 495 hectare cultural heritage / biodiversity offset area on the northern side of Thomas Mitchell Drive (see Figure 13), away from any mining tenements.

Aboriginal heritage assessment of the proposed Thomas Mitchell Drive Offset Area found that it is of comparable quality to the existing HMZs, particularly as it:

- is of larger size;
- contains a representative range of terrain units and Aboriginal site types, including rare types (67 Aboriginal sites were identified in field surveys); and

- is removed from mining activity and is therefore more accessible to the Aboriginal community.

DECCW does not object to the findings of the Aboriginal heritage assessment or the proposed mitigation measures, although it did comment that feedback from the Aboriginal community on the proposed management measures was generally lacking and that final comments from the registered groups should be sought.

Mt Arthur Coal provided additional information demonstrating that a considerable amount of consultation has been undertaken with the groups since preparation of the Aboriginal assessment report and the proposed management measures, in accordance with the requirements of DECCW's consultation guidelines.

Based on this consultation, 3 Aboriginal stakeholder groups (of 26) provided written responses on the draft Aboriginal assessment report, 2 of which accepted the findings of the report, whilst the third did not agree with the proposal to revoke the 3 HMZs. A further 6 groups provided written feedback on the specific management measures for the Saddlers Creek grinding grooves, with the majority of these responses favouring managing the grinding grooves in situ (rather than excavating and moving them to a keeping place). Mt Arthur Coal has designed the project accordingly.

The Department is satisfied with the level of Aboriginal heritage assessment (and consultation) in the EA, and on balance, is satisfied that the proposed management measures – including the proposed offsetting measures – would adequately compensate the cultural heritage impacts of the project.

To ensure that Aboriginal heritage is appropriately managed, the Department has recommended conditions requiring Mt Arthur Coal to:

- establish and conserve the Thomas Mitchell Drive Offset Area in perpetuity; and
- prepare and implement a comprehensive Heritage Management Plan for the project, in consultation with all applicable Aboriginal groups and DECCW.

5.8 Other Heritage

The EA includes a specialist non-indigenous heritage assessment, undertaken by Archaeology Australia. The assessment includes a literature review and site inspection to identify items of heritage significance.

Two heritage sites would be directly affected by the proposed expansion, and a further 7 sites have the potential to be affected either directly or indirectly. A summary of the impacts is presented in the following table.

Table 11: Heritage Impacts

Heritage Item	Significance	Impact	Management Proposed
Beer Homestead Slab Hut	Moderate	Direct impact	Archival recording, then relocation
Belmont Homestead Complex	Moderate	Direct impact	Archival recording, then demolition
Fence and Yards Site	Low	Avoid	None required
Windmill, tank stand and trough	Low	Avoid	Fenced to prevent impact
Farm and Farm House, 550 Edderton Road	Low	Avoid	Fenced to prevent impact
The Ruins Site	Low	Avoid	Fenced to prevent impact
Edinglassie Homestead	High ¹	Potential indirect (blasting) impact	Blasting designed to ensure compliance with relevant structural damage criteria, with periodic structural surveys
Rous Lench Homestead	High ¹	Potential indirect (blasting) impact	Blasting designed to ensure compliance with relevant structural damage criteria, with periodic structural surveys
Balmoral Homestead	High	Potential indirect (blasting) impact	None required. Blasting predicted to meet relevant structural damage criteria

1 These properties are listed on the NSW State Heritage Register

The Heritage Branch recommended a number of conditions, including requirements on Mt Arthur Coal to complete archival recordings of items scheduled for demolition prior to works beginning, undertaking the relocation of Beer Homestead in consultation with the Heritage Branch and informed

by a landscape study and architectural report⁴. The Department has recommended conditions reflecting these recommendations.

With regard to the blast-related indirect impacts on the significant Edinglassie, Rous Lench, Balmoral and other heritage properties, as discussed in Section 5.3, the Department is satisfied that the project blasting can be suitably managed to avoid impacting these heritage items.

The Department is satisfied that the project is able to be managed such that it would not significantly impact the heritage values of the locality. The Department has recommended a condition that would require Mt Arthur Coal to prepare and implement a comprehensive Heritage Management Plan for the project (as part of the wider plan for the Mt Arthur mine complex) in consultation with the Heritage Branch and local historical organisations, including requirements for:

- conservation management plans for the Edinglassie and Rous Lench homesteads;
- relocation of the Beer Homestead, as informed by a landscape study and architectural report;
- photographic and archival recording;
- protection of heritage items outside the disturbance area;
- dilapidation surveys;
- blast monitoring and management; and
- additional archaeological excavation and/or recording for any significant heritage items requiring demolition.

5.9 Traffic and Transport

Road Traffic

The majority of road traffic would access the site from Muswellbrook via the New England Highway, Denman Road, and Thomas Mitchell Drive (to the Mt Arthur mine access road) (see Figure 14).

Mt Arthur Coal's traffic assessment, undertaken by Hanson Bailey, indicated that the proposed expansion would increase traffic movements on:

- the Thomas Mitchell Drive/mine access road intersection by up to 32%;
- Thomas Mitchell Drive by up to 10.5%;
- Denman Road by up to 6.2%; and
- New England Highway by up to 2.7%.

The traffic assessment indicates that these increases would generally not affect the baseline level of service (LOS) of these roads, except for Thomas Mitchell Drive which would change from a LOS of 'D' (ie. near capacity) to a LOS of 'E' (ie. at capacity) for the section west of the mine access road by around 2014.

The EA notes that a section of Edderton Road would need to be realigned to accommodate the project. Mt Arthur Coal has identified 2 options for the realignment as shown on Figure 14.

⁴ The Heritage Branch's comments also referred to the Hospital Building, however it is noted that this item would not be affected by the project. Heritage management conditions for this item are included within the approval for the Mt Arthur Underground project.

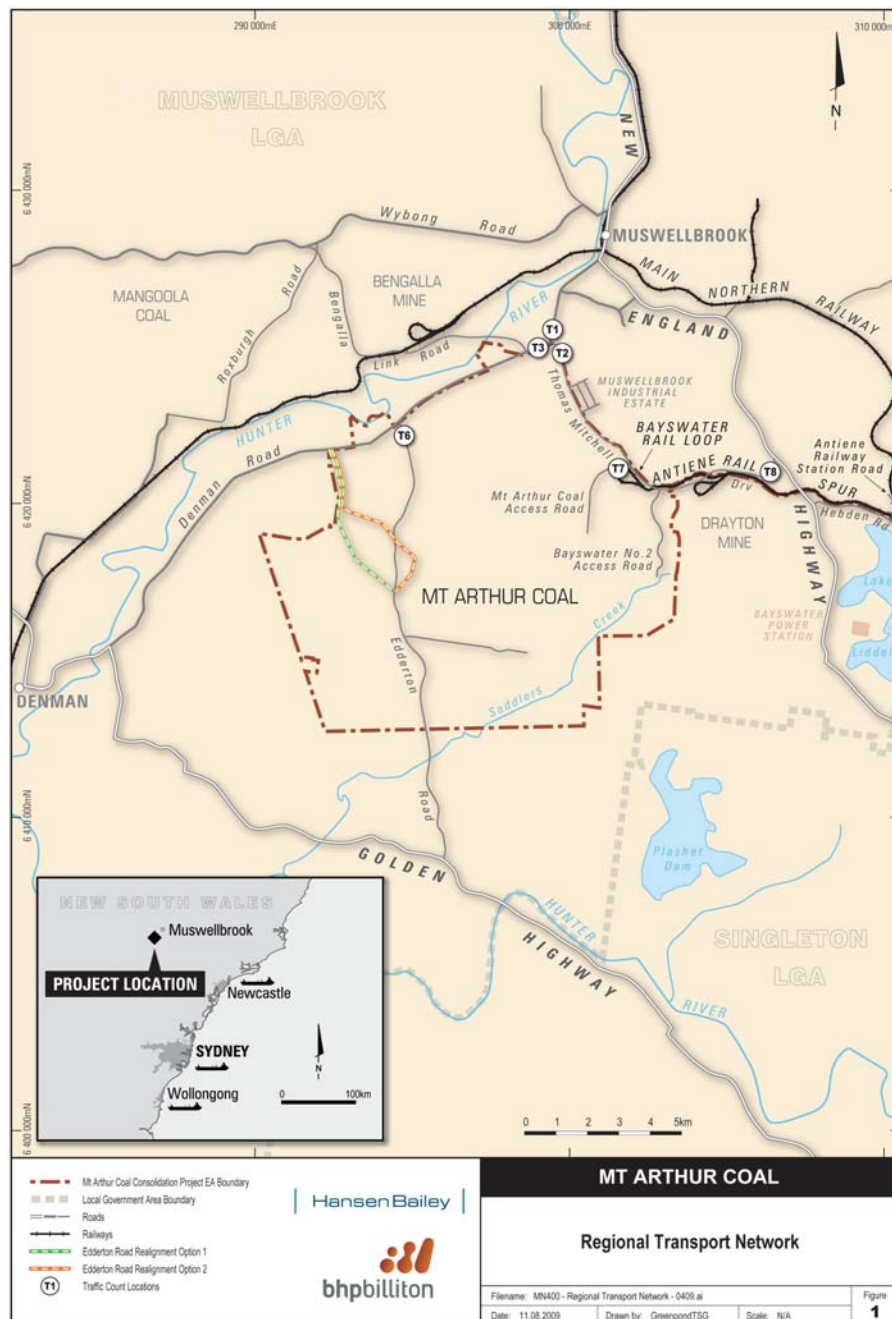


Figure 14: Regional Road Network

Thomas Mitchell Drive Upgrade

Following concerns raised by Council regarding the poor condition of Thomas Mitchell Drive and the need and responsibility for upgrading the road, the Department engaged the RTA to undertake an independent assessment of the route.

The RTA considered that the eastern section of Thomas Mitchell Drive (between the mine access and the New England Highway) is generally in poor condition, while the western section (between the mine access road and Denman Road) is in reasonable condition.

The RTA recommended a staged approach to upgrading the route, which could be delivered as 4 packages over 4 years, with priorities given to immediate preservation and rehabilitation. The total estimated cost of the upgrade is \$7.06 million, with ongoing maintenance costs estimated at \$230,000 a year.

Mt Arthur Coal has committed to a contribution of \$3 million toward the upgrade, which roughly equates to its proportionate use of the road (estimated at 39%). Mt Arthur Coal has also agreed to providing Council with the balance of the required funds (ie. \$4.06 million) as interest-free capital, so

that the full upgrade works can be completed in the short term⁵. Mt Arthur Coal has also agreed to contributing up to \$120,000 a year toward ongoing maintenance costs for the road, which would more than cover its proportionate use of the road.

Council acknowledges and accepts Mt Arthur Coal's contribution to the road upgrade works.

The Department is satisfied that Mt Arthur Coal's contribution would ensure that Thomas Mitchell Drive is able to be upgraded in the timeframe recommended by the RTA to address traffic and safety concerns. The Department is further satisfied that Mt Arthur Coal's proposed contribution is reasonable, particularly given that its contribution more than covers its proportionate use of the road.

With respect to the interest-free capital component of the contribution, the Department notes that another key user of the road, the Drayton mine, is currently in the initial planning stages of a project application for its mine, and would presumably be required to contribute toward the upgrade through any subsequent project approval. The Department is satisfied that additional funding would or could be made available through Council's road budget or other funding mechanisms (eg. through a section 94 contributions plan).

The Department has recommended conditions requiring Mt Arthur Coal to formalise these contributions through entering into a planning agreement with Council for the roadworks.

Other Traffic Issues

With regard to intersection performance, the traffic assessment in the EA indicates that the project would adversely affect the LOS of the intersections of Thomas Mitchell Drive/New England Highway and Thomas Mitchell Drive/Denman Road, with the project causing unsatisfactory performance of these intersections by 2011 and 2019, respectively.

The RTA does not object to the project, subject to Mt Arthur Coal upgrading these intersections to seagull-type intersections. However, the RTA did request additional information on the 'constructability' of the intersection upgrades. Based on additional specialist advice provided by Mt Arthur Coal, the Department is satisfied that the intersections can be adequately upgraded to provide seagull-type intersections at these locations.

The RTA also recommended conditions requiring Mt Arthur Coal to realign Edderton Road (and its intersection with Denman Road) in accordance with relevant standards and in consultation with the RTA and Council.

Further, the RTA noted that it did not support a proposed reduction in speed limit from 100 km/h to 80 km/h on a short section of Thomas Mitchell Drive, as recommended in the night-time road safety audit undertaken in 2008 by Mt Arthur Coal under the approval for the Mt Arthur South Pit Extension Project. Whilst noting that Thomas Mitchell Drive is a local road and therefore the responsibility of Council, the RTA recommended that consideration be given to the upgrading of the relevant section of Thomas Mitchell Drive to address any deficiencies. The Department is satisfied that such upgrades, or speed limit changes, can be managed by Council as part of the Thomas Mitchell Drive upgrade works detailed above.

The Department is satisfied that the local and regional road network is capable of accommodating the traffic associated with the project, subject to the identified upgrades. In this regard, the Department has recommended conditions requiring Mt Arthur Coal to:

- contribute to the upgrade of Thomas Mitchell Drive, in accordance with its offer to Council;
- upgrade the Thomas Mitchell Drive/New England Highway intersection in 2011 and the Thomas Mitchell Drive/Denman Road intersection by 2019; and
- realign Edderton Road and its intersection with Denman Road to the satisfaction of Council and the RTA.

Rail Traffic

The Mt Arthur mine complex currently has approval for a maximum 24 train movements per day on the Antiene rail spur and Main Northern Rail Line. The project does not propose any increase to this daily

⁵ This \$4.06 million capital would be repaid by Council from contributions from other projects that use the road (the mechanism would be detailed in the proposed planning agreement for the project).

maximum, however the project would increase the number of days when rail movements approach this maximum, given the proposed increase in production.

The EA indicates that the existing and planned rail infrastructure (including the proposed second on-site rail loading facility) would accommodate the rail traffic generated by the project.

However, the EA acknowledges that trains travelling on the Antiene rail spur periodically block the level crossing on Antiene Railway Station Road, which temporarily restricts access for one resident (WD Smith) in the area. In this regard, the EA includes a commitment to continuing to liaise with the relevant stakeholders (including ARTC, Council and other rail users) to minimise blockage of the level crossing.

Whilst acknowledging that Mt Arthur Coal is not responsible for signaling arrangements on the rail spur, and therefore does not have direct control over temporary blockages on the level crossing, the Department acknowledges this ongoing issue and has recommended a condition that would require Mt Arthur Coal to implement all reasonable and feasible measures to avoid blocking the level crossing. This would complement Mt Arthur Coal's commitment to liaising with the relevant stakeholders to address the issue.

5.10 Visual Amenity

The EA includes a specialist visual impact assessment undertaken by Integral Architecture and Visual Planning. The assessment considers the visual impacts of the project (including the impacts associated with night lighting) at 8 representative view locations around the site, and includes a number of photomontages which show the extent of visual impacts associated with the project.

The assessment focuses on the key visual effects of the project, including the increased size of active mining pits and, in particular, the increased size and height of overburden emplacements. In this regard, the project proposes to increase the height of the existing Mt Arthur North overburden emplacement to a maximum height of 375 metres AHD (average 360 metres AHD), and to develop a new out-of-pit overburden emplacement up to 360 metres high in the south-western area of the site. The existing approvals allow the Mt Arthur North emplacement to be constructed to a height of 300 metres AHD.

A summary of the predicted visual impacts of the project as defined in the visual impact assessment is presented in the following table, and the impact from some of the most affected locations is illustrated on Figure 15.

Table 12: Visual Impact Summary

Sector	View Location	Visual Impact ¹	
		Existing Mine Complex	Proposed Expansion
North	Roxburgh Road	High	High
	Racecourse Road	Low	Moderate-High
	South Muswellbrook	Low	High
	Ironbark Ridge Estate	Low-moderate	High
South	Golden Hwy / Saddlers Creek	Low	Moderate-high
West	Roxburgh Vineyard	High	High
	Denman Road	High	High
	Denman Township	Low	Low

1 Worst case impact, ie. prior to rehabilitation

The assessment also indicates that some receivers, particularly residents on Roxburgh Road, would experience direct and/or diffuse lighting effects, but that these effects would be similar to the effects associated with the existing mine complex, and would be mitigated to some degree by distance and intervening vegetation and topography.

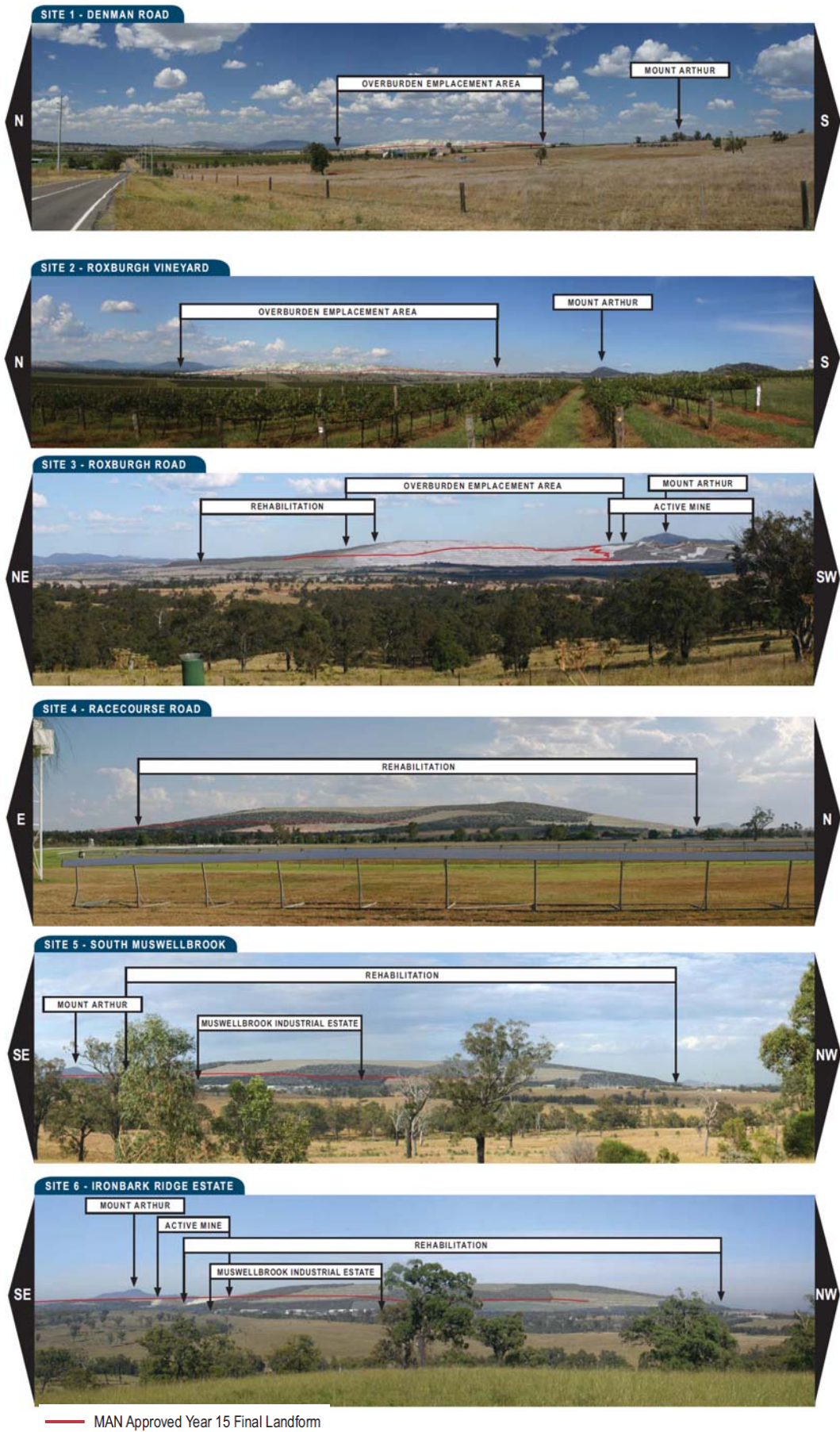


Figure 15: Visual Impact Photomontages

To mitigate the visual impacts of the project, Mt Arthur Coal proposes to implement a range of mitigation measures, that can be broadly categorised as:

- on-site measures, including:
 - o minimising the exposed area of overburden emplacements through prompt and progressive rehabilitation; and
 - o providing a considered and naturalistic form to the design and planting of overburden emplacements; and
- off-site measures, including:
 - o provision of landscaping treatments (ie. plantings) on affected residences and commercial enterprises (including Roxburgh Vineyard, Pukara Estate Olive Grove, Woodlands Stud, etc.); and
 - o provision of roadside planting on Denman Road if required.

Following additional consultations with Darley Australia (owner of the Woodlands Stud), Mt Arthur Coal has also committed to ensuring that the area of active workings on the faces of overburden emplacements exposed to views does not exceed 2.5% of the primary view zone.

With the implementation of these measures, the visual assessment indicates that the visual impacts would be reduced over the life of the project.

In its submission, Council recommended that the final landform for the project should not exceed 320 metres AHD, which is some 55 metres lower than the proposed maximum height of the overburden emplacements. It is understood that Council's rationale for this proposed limitation is related to maintaining the height of emplacements at a similar level to those of other mines in the locality, and reducing the visual effect on the regional landscape.

Whilst the Department acknowledges these concerns, it notes that such a limitation would require significant change to the proposed mine plan, including a significant increase in the lateral extent of the overburden emplacements, with resultant potential impacts on flora and fauna, heritage, water, etc. The Department does not believe that such a significant change is warranted or reasonable for the project.

Notwithstanding, the Department recognises that the project – particularly the overburden emplacements – would result in some visual impacts on surrounding residents, businesses (inc. vineyards and horse studs, some with commercial tourism elements), public spaces (including Muswellbrook Racecourse) and commuters on local roads. Although the existing mine complex (as approved) already impacts many of these receivers, the project would significantly increase these impacts from some locations.

However, the Department also acknowledges that it would not be possible to develop a mine the size of Mt Arthur without some visual impacts on surrounding landusers.

The Department also acknowledges that, although the project would result in some permanent changes to the visual landscape, including some loss of views to local landmarks such as Mt Arthur itself, the visual impacts would be reduced over time with the rehabilitation of disturbed areas.

To minimise impacts on visual receivers as far as is practicable, the Department has recommended conditions requiring Mt Arthur Coal to:

- identify properties that are expected to experience significant visual impacts as a result of the project;
- develop a suite of reasonable and feasible landscaping treatments (such as vegetative screens) that could be implemented to reduce the visual impacts of the project on these properties;
- notify these landowners that they are entitled to additional landscaping treatments to reduce the visibility of the mine from their properties; and
- on request from the landowner, implement reasonable and feasible landscaping treatments either at their property or in other areas that would assist in reducing visual impacts.

The Department has also recommended a number of other conditions that require Mt Arthur Coal to:

- prepare a biodiversity management plan for the mine complex that (amongst other matters) includes measures to landscape the project area to reduce the visual impacts of the project;
- rehabilitate the site as soon as practicable, particularly on visible areas of emplacements; and

- implement all reasonable and feasible measures to reduce night lighting impacts, and ensure that all external lighting associated with the project complies with relevant Australian Standards for controlling impacts of outdoor lighting.

In its submission, Council also recommended that Mt Arthur Coal be required to install a horse stud style fence along the frontage to Denman Road. Whilst it does not believe there is sufficient nexus to require Mt Arthur Coal to install this fence through conditions, the Department notes that Mt Arthur Coal and Council have recently agreed the broad terms of a planning agreement which includes contributions of \$6 million toward local community enhancement works (see below). Some of these funds could be used to install this fence, if Council and Mt Arthur Coal agree that this is a suitable use of the funds.

5.11 Socio-economics

The project would generate a large number of jobs and inject considerable capital investment into Muswellbrook and the broader Hunter region, which would have a range of benefits but may also put pressure on public services and facilities.

The EA includes a social impact assessment and an economic assessment, undertaken by Coakes Consulting and Gillespie Economics respectively, which attempt to identify, assess and analyse the project's socio-economic costs and benefits.

Cost Benefit Analysis

The assessments include a cost benefit analysis which seeks to calculate a net benefit/cost associated with the project based on its full range of environmental, social and economic impacts and benefits. These are illustrated in the table below.

Table 13: Costs and Benefits of the Project

	Potential Costs	Potential Benefits
Production	• Opportunity cost of land required for open cut expansion • Mining and infrastructure capital costs • Mine operating and rehabilitation costs	• Value of export and domestic product coal • Residual land value and capital at project end
Potential Externalities	• Air quality • Greenhouse gases • Noise and blasting • Ecology • Groundwater and surface water • Traffic and transportation • Aboriginal and non-Aboriginal heritage • Visual impacts	• Additional direct employment • Flow-on to regional service industries and regional employment • Additional contributions to government (taxes, royalties, etc)

The assessment calculates that the proposed expansion of the mine complex would have a net benefit to society of some \$1.8 billion.

The Department understands that this figure does not include consideration of the costs and benefits associated with downstream burning of the coal produced.

Notwithstanding, based on this assessment (and other similar cost benefit analyses undertaken for coal mines in the Hunter), the Department is satisfied that the project would result in a considerable net benefit to society.

Regional Economic Impacts

The assessments indicate that the project would provide considerable socio-economic benefits to the region and the State, including:

At the mine:

- 720 direct jobs during operation (increasing the total peak workforce at the mine complex to 2,600);
- 240 direct jobs during construction;
- \$784 million in initial capital investment;

For the Regional Economy:

- \$635 million in annual direct and indirect regional output;
- \$343 million in annual direct and indirect value-added (gross regional product);
- \$79 million in annual household income;

- 860 direct and indirect jobs;

For the NSW Economy:

- \$948 million in annual direct and indirect regional output;
- \$496 million in annual direct and indirect value-added (gross regional product);
- \$169 million in annual household income; and
- 1,989 direct and indirect jobs.

The EA includes an assessment of the impact of the project on public services and facilities in the Muswellbrook local government area, which indicates that:

- health services are already strained, and the project would strain these services further;
- primary and secondary schools are likely to have sufficient capacity to accommodate the project;
- child care services are already strained, and the project would strain these services further; and
- residential housing and accommodation in the area is likely to be sufficient to accommodate the project, given current initiatives to increase supply.

In its submission on the project, Council recommended conditions requiring Mt Arthur Coal to enter into a planning agreement with it to provide suitable contributions toward community enhancement works (including road maintenance, environmental promotion and education), and recommended a whole-of-government cumulative impact study to review the affect of mining on the community. Council also recommended that Mt Arthur Coal be required to indenture at least 12 first year apprentices per year from the Muswellbrook area, for the life of the project.

Since Council's submission, Mt Arthur Coal has offered to enter into a planning agreement with Council to provide a direct contribution of over \$10 million toward local community projects, including:

- \$3 million towards the upgrade of Thomas Mitchell Drive (plus an additional \$4.06 million in interest-free capital, to be repaid by Council from contributions from other projects that use the road);
- around \$1 million towards the ongoing maintenance of Thomas Mitchell Drive;
- \$6 million (ie. \$500,000 a year) towards local community projects; and
- \$0.25 million (ie. \$20,000 a year) towards environmental assessment funding for Council.

Mt Arthur Coal has also committed to targeting indenture of at least 8 first year apprentices per year from the Muswellbrook area, for the life of the project.

The Department notes that these contributions, whilst of benefit to the Muswellbrook area, would not directly benefit those public services with the most pressing current needs, including local health services and education. However the Department is satisfied that the project's considerable economic benefits to the broader regional and State economy would benefit and stimulate the orderly growth of these services by the public and private sectors. In particular, the Department notes that health and education are generally State responsibilities and royalties generated by the project would facilitate the provision of increased services as demand increases.

In its submission on the project, Darley Australia sought commitments from Mt Arthur Coal that it would monitor in-migrant employment (ie. employees coming from outside the region), and review its recruitment and training policies if this in-migrant population significantly exceeds the estimates made in the EA (ie. 20% in-migrant proportion of total employment), with a view to identifying means of improving local employment rates. Mt Arthur Coal has subsequently included a commitment in this regard, with reporting to occur in its annual reviews. The Department accepts that this commitment would assist in identifying employment trends and encourage local employment.

Project Need

The Department recognises that society is currently heavily reliant on coal to meet its basic energy needs (both at a domestic and international level). Coal provides around 90% of NSW's electricity needs, 75% of Australia's electricity needs and 40% of the world's electricity needs.

Access to energy remains a critical development need, particularly for the one-third of the world's population without electricity. As living standards and development in Third World countries increase, it is expected that the demand for coal will rise to satisfy increasing global energy requirements. The Mt Arthur Consolidation Project would contribute to supplying this rising annual coal demand.

Therefore the ultimate need for the project is driven by both domestic and international markets to meet current and future energy needs.

Consequently, the Department is satisfied that there is a demonstrable need for the project in terms of meeting society's need for adequate, reliable and affordable energy.

At the local level, the Department recognises that the proposed area of coal extraction is largely surrounded by existing mining operations undertaken by Mt Arthur Coal and Anglo Coal (Drayton). The project is able to be undertaken using existing mining facilities and infrastructure. In this regard, the Department acknowledges that the project represents a logical extension to existing coal mining activities at Mt Arthur.

From the State's perspective, the project would deliver a number of key benefits as outlined above, including the generation of 240 construction and 720 operational jobs at the Mt Arthur mine complex, flow-on regional economic benefits, and significant royalty and tax income.

Notwithstanding the above, the Department recognises that a balance must be met in the promotion and co-ordination of the orderly and economic use of land; the proper management and development of the State's resources; and the protection of the environment and ecologically sustainable development. The Department has considered these matters in detail in its assessment of the project.

In summary, the Department is satisfied that the socio-economic benefits of the project are likely to far exceed its costs, and is satisfied that the region would be able to accommodate the project. The Department has recommended conditions requiring Mt Arthur Coal to enter into a planning agreement with Council, to formalise the agreed community enhancement strategy.

6. RECOMMENDED CONDITIONS

The Department has prepared recommended conditions of approval for the project (see Appendix B), and summarised these conditions in Appendix A. These conditions are required to:

- prevent, minimise, and/or offset adverse impacts of the project;
- set standards and performance measures for acceptable environmental performance;
- ensure regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

Mt Arthur Coal has reviewed and accepts the recommended conditions. The Department believes the conditions reflect current best practice for the regulation of coal mines in NSW.

7. CONCLUSION

The Department has assessed the project application, EA, submissions on the project and Mt Arthur Coal's response to submissions, in accordance with the relevant statutory requirements.

This assessment has found that, whilst the project would result in some adverse environmental impacts – including significant dust and/or noise impacts on 21 privately-owned properties (owned by 16 separate landowners), clearing of 842 hectares of endangered ecological community, along with visual and potential groundwater impacts – the Department is satisfied that these impacts can be adequately mitigated, managed, offset and/or compensated for. The Department has recommended a broad range of contemporary conditions to ensure this occurs.

The Department acknowledges that the project represents a logical extension of the existing mine complex, and that it would make use of existing infrastructure and facilities. The Department also recognises that the project would provide major economic and social benefits for the Hunter region and to NSW, including:

- a direct capital investment in the mine complex of \$784 million;
- generating 720 direct new jobs at the mine complex; and
- generating almost 2,000 new direct and indirect jobs across NSW.

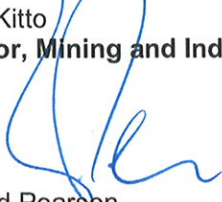
On balance, the Department believes that the project's benefits would sufficiently outweigh its residual costs, and that it is therefore in the public interest and should be approved, subject to conditions.

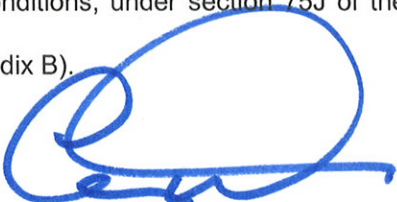
8. RECOMMENDATION

It is RECOMMENDED that the Minister:

- consider the findings and recommendations of this report;
- approve the project application, subject to conditions, under section 75J of the *Environmental Planning and Assessment Act 1979*; and
- sign the attached project approval (see Appendix B).


David Kitto
Director, Mining and Industry


Richard Pearson
Deputy Director-General, DASP


Chris Wilson
Executive Director, MPA


Sam Haddad
Director-General
20/9/2010

APPENDIX A - SUMMARY OF CONDITIONS OF APPROVAL

Aspect	Condition	Requirement
Schedule 2: Administrative Conditions		
Terms of Approval	5	Approval for mining restricted to 2022
	6	Restriction on production to 32 million tonnes of coal a year from the project, and 36 million tonnes a year from the mine complex
	7	All coal to be transported by rail
Surrender of Consents	8	Requirement to surrender all existing consents for the project
Contributions	14	Requirement to enter into planning agreement with Council
Schedule 3: Specific Environmental Conditions		
Land Acquisition	1	Acquisition rights for significantly affected privately owned land
Noise	2-6	Noise impact assessment and acquisition criteria
	7	Additional noise mitigation measures for noise affected properties
	8	Requirement to implement best noise management practice
	9	Noise Management Plan
Blasting	10	Blast impact assessment criteria
	11-12	Restriction on blasting hours and frequency of blasting
	13-15	Rights for structural property inspections for properties potentially affected by blasting
	16	Blast related operating conditions
	17	Blast Management Plan
Air Quality and Greenhouse	18-19	Requirement to minimise odour and greenhouse gas emissions
	20-21	Air quality impact assessment criteria and acquisition criteria
	22	Additional air quality mitigation measures for dust affected properties
	23	Requirement to minimise air quality impacts
	24-25	Air Quality Management Plan, and meteorological monitoring
Soil and Water	28	Restriction on mining near Hunter River and Saddlers Creek alluvials
	29-34	Site Water Management Plan
	35	Requirement to remediate contaminated land
Biodiversity	36-39	Requirement to implement the Offset Strategy, and to arrange for long term security of the offset areas Rehabilitation Strategy
	40	Biodiversity Management Plan
	41	Requirement to lodge a Conservation and Biodiversity Bond
Rehabilitation	42	Rehabilitation Strategy
	43	Requirement to progressively rehabilitate the site
	44	Rehabilitation Management Plan
Heritage	45	Heritage Management Plan
Transport	47	Requirements to upgrade roads and intersections
Visual	49-51	Requirement to undertake visual screening on affected properties, and to minimise project's visual and lighting impacts
Waste Minimisation	53	Requirement to monitor and minimise waste
Schedule 4: Additional Procedures		
Notification of Landowners	1-3	Requirement to notify landowners of acquisition rights, exceedances of criteria during monitoring, and potential health and amenity impacts associated with exposure to fine particulates
Independent Review	4-6	Procedures for independent review if landowners believe the project to be exceeding relevant impact assessment criteria
Land Acquisition	7-8	Procedures for land acquisition
Schedule 5: Environmental Management, Monitoring Auditing and Reporting		
Environmental Management Strategy	1	Environmental Management Strategy
Annual Review	3	Annual Review
CCC	5	Requirement for Community Consultative Committee
Incident Reporting	7-8	Requirement to report incidents
Auditing	9-10	Requirement to undertake regular independent environmental audits
Access to Information	11	Requirement to publicly report environmental information

APPENDIX B – CONDITIONS OF APPROVAL

APPENDIX C – CONSIDERATION OF ENVIRONMENTAL PLANNING INSTRUMENTS

1 SEPP No.33 – Hazardous and Offensive Development

The Department is satisfied that the project is not potentially hazardous or offensive, and that the proposal is generally consistent with the aims, objectives, and requirements of SEPP 33.

2 SEPP No.44 – Koala Habitat Protection

A koala habitat assessment was completed as part of the ecological assessment of the project, and no core koala habitat was identified. The Department is satisfied that the project is unlikely to significantly affect koala habitat, and that the project is generally consistent with the aims, objectives, and requirements of SEPP 44.

3 SEPP No.55 – Remediation of Land

The Department is satisfied that the project area does not have a significant risk of contamination given its historical landuse, and that the project is generally consistent with the aims, objectives, and provisions of SEPP 55.

4 SEPP (Mining, Petroleum Production and Extractive Industries) 2007

Under clause 7 of the Mining SEPP, the project is permissible with consent.

Part 3 of the 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 with other land uses;
- natural resource management and environmental management;
- resource recovery;
- transport; and
- rehabilitation.

The Department has considered all of these matters in its assessment of the project. Based on this assessment, the Department is satisfied that the project is able to be managed in a manner that is generally consistent with the aims, objectives, and provisions of the Mining SEPP.

5 SEPP (Infrastructure) 2007

Under clause 45 of the Infrastructure SEPP, development in the vicinity of an electricity supply easement is required to be referred to the electricity supply authority for comment. Energy Australia made a submission on the project (see assessment report), and the project is not expected to result in any significant impacts to electricity supply infrastructure, subject to relocation of some low voltage powerlines.

In accordance with clause 104 of the SEPP, the application was referred to the RTA, which subsequently confirmed that it does not object to the project (see assessment report).

6 Hunter Regional Environmental Plan (REP) 1989 (Heritage)

The Department is satisfied that the project is able to be managed in a manner such that it would not impact historic heritage items in the vicinity of the site, and that the project can be carried out in a manner that is generally consistent with the aims, objectives, and provisions of the REP.

7 Muswellbrook Local Environmental Plan 2009

The permissibility of the project under the Muswellbrook LEP is discussed in the assessment report. As outlined, the subject land is primarily zoned RU1 Primary Production under the LEP, with a smaller portion zoned E3 Environmental Management. Mining is permissible with consent in the RU1 zone, but prohibited in the E3 zone.

Notwithstanding, the Mining SEPP (see above) makes underground mining permissible with consent on all land.

APPENDIX D – MT ARTHUR COAL'S RESPONSE TO SUBMISSIONS

See attached CD-Rom

APPENDIX E – SUBMISSIONS

See attached CD-Rom

APPENDIX F – ENVIRONMENTAL ASSESSMENT

See attached CD-Rom