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RIXS CREEK MINE - CONTINUATION OF MINING PROJECT

Environmental Impact Statement

Revised Response to Submissions

Prepared for
The Bloomfield Group
Four Mile Creek Road
Ashtonfield | NSW | 2323
Australia

THE Bloomfield GROUP

RIX'S CREEK

Revised Response to Submissions Report

SSD_6300 Rix's Creek Continuation of Mining Project

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Glossary of Terms

Term	Definition
Aboriginal cultural heritage	The tangible (objects) and intangible (dreaming stories, songlines, places) cultural practices and traditions associated with past and present day Aboriginal communities.
Active workings	Any place in a mine where miners are normally required to work or travel.
Annual recurrence interval (ARI)	Used to describe the frequency or probability of floods occurring (e.g. a 100 year ARI flood is a flood that occurs or is exceeded on average once every 100 years).
Aquifer	Geologic formation, group of formations, or part of a formation capable of transmitting and yielding quantities of water.
Archaeological site	A site with material evidence of past Aboriginal or non-Aboriginal activity in which evidence of past activity is preserved.
Archaeology	The scientific study of human history, particularly the relics and cultural remains of the distant past.
Blast	A controlled explosion which is used to loosen the substance being mined.
Bloomfield	Bloomfield Collieries Pty Ltd – Consent Holder
Bore	A cylindrical drill hole sunk into the ground from which water is pumped for use or monitoring.
Borehole	A hole produced in the ground by drilling for the investigation and assessment of soil and rock profiles.
Catchment	The area from which a surface watercourse or a groundwater system derives its water.
Carbon dioxide equivalents (CO_{2e})	Carbon dioxide equivalents. Used as a standard measurement of the level of effect of various gases on the atmosphere, particularly greenhouse gases.
Clearing	The removal of vegetation or other obstacles at or above ground level.
Coal Handling and Preparation Plant (CHPP)	Treatment by screening coal into various sizes to meet a purchasers requirements and treatment by one or more processes to reduce the amount of waste (ash) present in the coal.
Coking coal	Coal suitable for the manufacture of coke.
Cover	The overburden above the coal resource.
Cumulative impacts	Combination of individual effects of the same kind due to multiple actions from various sources over time.
Cut	Mechanically slice a coal seam to extract the coal resource.
Decibel (dB)	A scale unit used in the comparison of powers and levels of sound energy. Used for measuring noise.
Discharge	A release of water from a particular source.
Drainage	Natural or artificial means for the interception and removal of surface or subsurface water.
Earthworks	Operations involved in loosening, excavating, placing, shaping and compacting soil or rock.
Ecology	The study of the relationship between living things and the environment.
Ecologically sustainable development (ESD)	As defined by the *Protection of the Environment Administration Act 1991*, requires the effective integration of economic and environmental considerations in decision making processes including: The precautionary principle. Inter-generational equity. Conservation of biological diversity and ecological integrity. Improved valuation, pricing and incentive mechanisms (includes polluter pays, full life cycle costs, cost effective pursuit of environmental goals).
Ecosystem	As defined in the *Environment Protection and Biodiversity Conservation Act 1999*, an ecosystem is a 'dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.'

Term	Definition
Emission	The discharge of a substance into the environment.
Endangered Ecological Community (EEC)	An ecological community identified by the *Threatened Species Conservation Act 1995* that is facing a very high risk of extinction in New South Wales in the near future, as determined in accordance with criteria prescribed by the regulations, and is not eligible to be listed as a critically endangered ecological community.
Environmental management system (EMS)	A quality system that enables an organisation to identify, monitor and control its environmental aspects. An EMS is part of an overall management system, which includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy.
Environment	As defined within the *Environmental Planning & Assessment Act, 1979*, all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings.
Ephemeral	Existing for a short duration of time.
Environmental Protection Licence (EPL)	Environment Protection Licence. EPLs are issued by Environment Protection Authority under the *Protection of the Environment Operations Act 1997*. EPLs with respect to scheduled development work or scheduled activities or non-scheduled activities may regulate all forms of pollution (including water pollution) resulting from that work or those activities. EPLs authorising or controlling an activity carried on at any premises may also regulate pollution resulting from any other activity carried on at the premises to which the licence applies.
Existing Permitted Mining Area	The area of land on which Bloomfield has approval to undertake mining activities under its existing development consent DA 49/94.
Frequency (sound)	The number of cycles per second (Hertz) of anything that oscillates is called the "frequency". Most sounds comprise a composite of frequencies of varying sound-pressure levels in the range of 20 Hertz to 20,000 Hertz.
Greenhouse gases	Gases with the potential to cause climate change (e.g. methane, carbon dioxide and others listed in the *National Greenhouse and Energy Reporting Act 2007*). Expressed in terms of carbon dioxide equivalent.
Green waste	Organic waste resulting from the trimming, pruning, lopping, cutting or felling of any form of vegetation, for example grass, trees or shrubs.
Groundwater	Water located within an aquifer; that is, held in the rocks and soil beneath the earth's surface.
Habitat	The place where a species, population or ecological community lives (whether permanently, periodically or occasionally).
Hydrogeology	The study of subsurface water in its geological context.
Hydrology	The study of rainfall and surface water runoff processes.
Impact	Influence or effect exerted by a project or other activity on the natural, built and community environment.
Integra Mine	The Integra Open Cut Coal Mine. Formerly the Camberwell Open Cut Mine). Integra Mine includes: Integra Open Cut Mine, the Integra CHPP and the Integra Rail Loop. All these areas are part of Rix's Creek North Open Cut Project 08_0102.
Intrusive noise	Intrusive noise, as defined in the NSW Industrial Noise Policy, refers to noise that intrudes above the background level by more than five decibels.
Landscape character	The aggregate of built, natural and cultural aspects that make up an area and provide a sense of place. Includes all aspects of a tract of land – built, planted and natural topographical and ecological features.
New Disturbance Area	The area which will be disturbed by the Project outside the Existing Permitted Mining Area
Overburden	The geological units and material above the coal seam proposed or being mined.

Term	Definition
Potential archaeological deposit (PAD)	A location considered to have a potential for subsurface archaeological material.
Pollutant	Any matter that is not naturally present in the environment.
Product coal	Coal that has been processed within the processing plant to remove unwanted waste rock and prepared to customers specifications.
Project Area	This is the area within which the entire Project is situated and includes the Existing Permitted Mining Area and New Disturbance Area.
Rehabilitation	The return of disturbed land to a stable, productive and self-sustaining condition, after taking into account beneficial uses of the site and surrounding land.
Revegetation	Direct seeding or planting (generally with native species) within an area in order to re-establish vegetation that was previously removed from that area.
Riparian	Relating to the banks of a natural waterway.
Rixs Creek	The creek running through the Rix's Creek Mine.
Run-off	The portion of water that drains away as surface flow.
Run of mine (ROM)	Raw coal production that contains coal and rock.
Seam	Layer or bed of coal.
Sensitive receiver	A location where a person works or resides, including residential, hospitals, hotels, shopping centres, play grounds, recreational centres or similar.
Stockpile	Stored materials such as product coal, soil, sand, gravel and spoil/waste.

Punctuation Note

Rix's Creek Nomenclature

Regarding the punctuation of this report, please note that both the suburb Rixs Creek and the watercourse Rixs Creek do not have an apostrophe within the correct presentation of their name. However the name of the Mine and the Project are correctly presented in this report as Rix's Creek Coal Mine and the Rix's Creek Continuation of Mining Project, as per the name used in official mine documentation by The Bloomfield Group.

'Would' 'Will' Statement

As a determination on the project will only be made after the Revised Response to Submissions Report has been assessed and considered, the future conditional tense is used throughout the report when describing the Project and the proponent's commitments. 'Would' is therefore used throughout the text in preference to 'Will'. If approval is given to the project to proceed under the NSW environmental planning legislation, all 'would' references should be interpreted as 'will'.

The revised management measures detailed in Section 8.0 use the term 'Will' as these are the proponent's commitments which would form part of the project approval.

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Executive Summary

Introduction

Bloomfield Collieries Pty Ltd (the Proponent) is a subsidiary of The Bloomfield Group, which owns and operates the Rix's Creek Mine (the Mine), an open cut coal mine in the Hunter Valley Coalfields of NSW. The Proponent (referred to as Bloomfield in this report) is seeking approval for the continuation of existing multi-seam benching open cut mining operations, the Rix's Creek Continuation of Mining Project (the Project), within Coal Lease (CL) 352 and Mining Lease (ML) 1432. The Project would allow the Mine to continue its open cut mining operations and utilisation of existing mine infrastructure to process up to 3.6 million tonnes per annum (Mtpa) of Run of Mine (ROM) coal beyond the life of its current consent, extending the life of mining until approximately 2038. The Project also includes a new mine lease area (currently known as Mine Lease Application Area (MLA) 487) to the west of the existing ML to accommodate the proposed new overburden emplacement area. The Project includes all development approved under the existing development consent DA 49/94 (as modified in this application), which would be surrendered.

Approval for the Project is being sought as State Significant Development (SSD) under Division 4.1, Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Project meets the SSD requirements set out in Schedule 1, Clause 5 of the *State Environment Planning Policy (State and Regional Development) 2011,* being development for the purpose of coal mining. The Project is declared to be SSD for the purposes of the EP&A Act and the Minister for Planning is the approval authority. For large coal mining projects however the Minister has delegated the planning approval powers to the NSW Planning Assessment Commission (PAC). The Project is subject to an assessment by the PAC under Division 4.1, Part 4 of the EP&A Act.

Environmental Impact Statement

In accordance with the requirements of the EP&A Act, an EIS was prepared, to assess the potential environmental impacts of the Project and to address the Director General's Requirements issued for the Project. The EIS was submitted to the Department of Planning and Environment (DP&E) and placed on public exhibition between 3 November 2015 and 3 December 2015.

The EIS was made available on the DP&E website and in hard copy at several locations for public viewing. Hard copies were also provided to key stakeholder agencies for exhibition or review purposes. During public exhibition of the EIS, a range of consultation activities were undertaken by the Proponent to raise awareness of the public exhibition, to provide information about the EIS and to advise community members on how to make a formal submission.

Revised Response to Submissions

During the exhibition of the EIS, 140 submissions were made. In accordance with clause 85A of the *Environmental Planning and Assessment Regulation 2000*, the DP&E provided copies of the submissions to the Proponent, and requested the preparation of a report detailing a response to the issues raised in the submissions. In October 2016, a Response to Submissions Report (the original Response to Submissions Report) was prepared to detail and provide responses to issues raised in the submissions received during the EIS exhibition period.

Since the completion of the EIS exhibition period, a number of matters have arisen with regard to the Project:

- Government agencies and the DP&E have requested further clarifications on the EIS;
- Bloomfield Collieries Pty Ltd and DP&E agreed to consent orders in the Land and Environment Court of New South Wales in regard to a compliance matter, which has required additional assessment to complement the EIS; and
- The Project description has been updated to make necessary amendments as a result of the purchase of the Integra Open Cut Mine by Bloomfield Collieries Pty Ltd and to remove the diversion of Stonequarry Gully.

These matters have necessitated the preparation of this Revised Response to Submissions Report (RRTS). The purpose of the RRTS is to provide a consolidated document which details:

- The response to the issues raised in the submissions received during the exhibition period as provided in the original Response to Submissions Report;
- The response to issues raised outside of the exhibition period by Government Agencies;
- A description of Project implications and additional assessment undertaken following the resolution of a compliance matter with the DP&E; and
- A description of updates to the Project following the completion of the EIS exhibition period.

Changes to the Project since the exhibition of the EIS

Purchase of Integra Open Cut Mine

Following the public exhibition of the EIS in November 2015, the Proponent entered into an agreement to purchase the Integra Open Cut Mine (Integra Mine) which lies to the immediate north of the Rix's Creek Mine. The Integra Open Cut Mine ceased operation and was placed in care and maintenance in August 2014 by its former owners. Since purchasing the Integra Mine, Bloomfield has recommenced mining on the site. The Integra Mine has a maximum development consent production level of 6 Mtpa ROM coal, and after recommencing operations exported its first coal during June 2016.

The Integra Mine operates in accordance with Project Approval 08_0102 issued under Part 3A (repealed) of the EP&A Act.

Whilst the Rix's Creek Mine and Integra Mine are separate operations, operating under separate approvals, synergies between the two operations have allowed Bloomfield to re-evaluate elements of the proposed Project. This has presented Bloomfield with opportunities to reassess the Project production levels, leading to improved environmental performance and social and economic outcomes.

The purchase of the Integra Mine and Rail Loop means that there is no longer a need to construct a rail loop at Rix's Creek (as approved under DA 49/94 MOD 5), and Bloomfield now commits to surrender of this modification as part of the current Project. This would mean that potential impacts predicted as a result of the construction and operation of the rail loop would not occur.

The current designed production levels for the Integra Mine are 2.2 Mtpa ROM coal. The utilisation of the Integra Mine resource means the originally planned maximum production levels from the Rix's Creek Mine as presented in the EIS can be reduced during the peak years of 2021 to 2025, and still allow for the satisfaction of Bloomfield's long term customer requirements. The mine schedule for the Project has therefore been amended to reflect these changes. Instead of mining up to 4.5 Mtpa ROM coal over the three year period 2021 – 2023, a lower annual maximum of 3.6 Mtpa ROM coal would be mined over the five year period 2021 – 2025. All other scheduled indicative production years remain unchanged and are already lower than these years.

A reduction in the maximum production levels for the Project would result in a subsequent reduction in impacts, particularly noise and air quality impacts. In addition, the purchase of the Integra Mine has allowed Bloomfield to integrate a large percentage of the acquired mobile plant and critical spare parts into its Rix's Creek Mine operation. The immediate integration of the noise attenuated rear dump trucks and front end loaders (now surplus to the Integra Mine's requirements) effectively results in earlier implementation of key noise control measures. This would reduce noise emission in the earlier stages of the Project.

Key benefits associated with the purchase of the Integra Mine include:

Environment and Community benefits:

- The mines are centrally managed to achieve integrated rehabilitation and environmental outcomes over both sites instead of being run independently;
- The same Australian owned company with a good track record of community engagement and consultation is available for community consultation across both mines;
- Both sites can be run collectively to achieve reduced environmental impact. For example, a water balance across both sites may reduce the need to import or dispose of water at either mine;
- From a regulatory perspective, regulators can work with a single entity to achieve common goals across both mines; and
- The Rix's Creek Mine no longer requires a standalone rail loop as it has secure access to the Integra Mine Rail Loop, therefore the approved rail loop can be removed from the Project and the modification approval for the rail loop surrendered. This would eliminate any impacts associated with the rail loop.

Economic benefits:

- Mobile plant replacement costs can be reduced by the utilization of excess Integra Mine mobile plant;
- A large inventory of mobile plant critical spare parts reduce repair and maintenance costs in the early years of the Project;
- Management costs are reduced at Rix's Creek Mine by spreading corporate overheads across increased production levels; and
- Acquisition of the Integra Mine Rail Loop removes the access fees to use the rail loop that Bloomfield had previously been paying to Vale.

Rix's Creek Mine has a well-established rehabilitation program, which includes short, medium and long term measures to achieve the overall rehabilitation objectives for the site. The purchase of the Integra Mine provides the future opportunity to integrate the environmental management and rehabilitation activities between the two operations.

Removal of Stonequarry Gully diversion

Another Project change that has occurred since the exhibition of the EIS, involves the removal of the requirement to divert Stonequarry Gully. Following further consideration by the Proponent, the diversion of Stonequarry Gully as proposed in the EIS has been removed from the Project and approval is no longer being sought for this part of the Project. This diversion was originally proposed in order to provide access to a coal resource of approximately 300,000 tonnes saleable coal, and would not have been required until approximately 18 to 20 years into the Project lifespan. Should changes to the operation in the future make it desirable to access this resource, Bloomfield would enter into a separate approval or modification process to obtain the approvals necessary for the Stonequarry Gully diversion.

Compliance matters

During the assessment of the EIS, DP&E identified a potential discrepancy between the proposed disturbance area identified in the Project EIS and the disturbance area identified in the environmental assessment that accompanied the development application for DA 49/94. Subsequent action was undertaken by DP&E to define the Existing Permitted Mining Area and therefore enable the impacts of the Project to be accurately defined and assessed. DP&E formed the view that various mining operations at Rix's Creek Mine were not carried out in accordance with the development consent. Rix's Creek Mine had at all times reported the carrying out of such mining operations to DP&E but in the interests of reaching a resolution on the issue that would not delay this application, agreed to development consent orders under the EPA Act and an enforceable undertaking under the Mining Act 1992 to rectify the issue. It was resolved that the Existing Permitted Mining Area plus all other mining infrastructure within the Project Area is approved under DA49/94.

This RRTS document clarifies and confirms the area for environmental assessment for the Rix's Creek Continuation of Mining Project SS_6300. This RRTS report provides additional assessment of the New Disturbance Area to ensure all disturbance proposed by the Project has been fully and comprehensibly assessed. The additional assessment concluded that there would be no significant impacts as a result of the Project.

Submissions

During the public exhibition of the EIS, 140 submissions were made, including 8 from Government agencies, 1 from Singleton Council, 16 from special interest groups or organisations, and 115 from individual community members. Of the 115 community submissions received, more than two thirds (79) were in support of the Project.

Key issues raised in Government agency submissions related to:

- Groundwater modelling;
- Water licensing;
- Air quality impacts;
- Noise impacts;
- Threatened species mapping and biodiversity offset calculations; and
- Flooding impacts.

Key issues raised in special interest group and individual public submissions included:

- Climate Change;
- Air Quality impacts, particularly relating to PM_{10};
- Noise impacts to local residents;
- Blasting management;
- Transport of coal (including rail congestion and covering of coal wagons);
- Biodiversity offset areas and impacts to biodiversity as a result of loss of habitat;
- Surface water impacts;
- Groundwater impacts;
- Final void;
- Economic assessment; and
- Cumulative impact assessment.

An overview of the issues raised in submissions is provided in **Section 5.0** and responses to submissions in **Section 6.0** and **Section 7.0** of this RRTS Report.

Following the completion of the formal public exhibition of the EIS, additional clarifications were requested by Government agencies. A response to these requested clarifications are provided in **Section 6.0** and **Section 7.0**.

Revised Environmental Management Measures

The safeguards and mitigation measures provided in the EIS were reviewed as part of this response to submissions process. A final summary of the safeguards and mitigation measures to be implemented for the Project is provided in **Section 8.0**.

Conclusion and Next Steps

This RRTS Report has provided additional information to address the issues raised in the submissions as well as addressing issues related to project developments subsequent to the public exhibition of the EIS and provides details on recent measures and modifications that materially reduce the environmental impacts when compared to the original submission. This has included additional information relating to the groundwater modelling, water licensing, air quality assessment, remapping of vegetation communities, recalculation of biodiversity offset credits, potential flooding impacts, noise impacts, and economic assessment.

The DP&E will now assess the Project in consultation with other relevant agencies, and the assessment process will include review of the EIS and this RRTS Report. The DP&E will then prepare a draft assessment report for consideration by the Minister for Planning or his delegate. The Minister for Planning has delegated his role in the determination of coal mine projects to the PAC. Therefore, the Project will be referred to the PAC, and the PAC will review the assessment and provide a determination on the Project.

Where this document is inconsistent with the earlier EIS or RTS, this document takes precedence over them.

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1.0 Introduction

1.1 Overview

1.1.1 Background to the Project

The Bloomfield Group owns and operates the Rix's Creek Mine (the Mine), an open cut coal mine approximately 5km north-west of Singleton in the Hunter Valley Coalfields of NSW. It currently produces approximately 1.5 million tonnes per annum (Mtpa) of product coal from its existing operations.

The Proponent, Bloomfield Collieries Pty Ltd (hereon referred to as Bloomfield), a subsidiary of The Bloomfield Group is seeking approval for the continuation of existing multi-seam benching open cut mining operations (and associated activities), the Rix's Creek Continuation of Mining Project (the Project), within Coal Lease (CL) 352 and Mining Lease (ML) 1432. The Project would allow the Mine to continue its open cut mining operations and use of existing mine infrastructure to process up to 3.6 Mtpa of Run of Mine (ROM) coal, (coal not yet processed at the Coal Handling and Preparation Plant (CHPP), which equates 2.2 Mtpa of saleable coal, beyond the life of its current development consent. The Project also includes a continuation of the mining footprint in a westerly direction to accommodate a proposed overburden emplacement area under a new Mining Lease Application Area (MLA) 487.

1.1.2 Existing Operations

The Proponent has owned and operated the Mine since 1990. Current open cut mining operations extend east and west of the New England Highway with coal extracted from within the Hebden, Barrett, Liddell, Arties, Pikes Gully and Lemington seams of the Whittingham Coal Measures. Within these coal seams, 35 separate coal bands are mined which predominately produce thermal and semi-soft coking coal for export with small quantities for domestic consumption. Onsite blending of washed coal produces the different product specifications for thermal and semi soft coking coal for customers. A truck and excavator method is used to remove and stockpile topsoil prior to mining operations. Overburden is then drilled and blasted, with blasting requirements dependent on the characteristics of the overburden and development consent limits.

The range of equipment used to remove the overburden and recover ROM coal, enables extraction from coal bands down to 150mm in thickness at grades varying up to 28 degrees, maximising coal recovery. Coal is currently extracted from Pit 3 to the west of the New England Highway at production rates of around 2.5 Mtpa of ROM coal. Annual production is currently around 1.5 Mtpa of product coal. Once coal is extracted, pits are variously filled with overburden or used for tailings emplacement. Both Pit 1 (east of the New England Highway) and Pit 2 (west of the New England Highway) have been used for tailings emplacement. Pit 2 has reached capacity with dewatering and rehabilitation progressing.

Due to seam splitting and geological variability in seam thickness within the deposit, resource recovery is currently maximised at times by extracting thin coal seams with extra interburden and partings increasing ROM tonnage. This causes an increase in total ROM tonnes delivered to the CHPP in order to achieve the same amount of saleable product. The current Development Consent, DA 49/94 as modified, has an approved limit for total material movement of 16.1 million bank cubic metres per year, rather than a ROM coal tonnage which facilitates the current mining method to maximise coal resource recovery.

After coal is extracted, it is washed onsite at the existing Coal Handling and Processing Plant (CHPP), before being transported by rail, to export customers and domestic customers. Coal stockpiles and rail loading facilities are located outside of the current mining lease area, along the Integra Mine Rail Loop. Surface infrastructure facilities are located within CL 352 and ML 1432. The Mine has historically processed ROM coal from other sites and loaded it onto trains and it is envisaged that this would continue under the Project. The processing of ROM coal from other sites is provided for by the Mine's current development consent. For the Project, the Mine would retain the ability to receive, process and loadout coal from outside sources within approved production limits.

The Mine has approval to operate 24 hours a day, seven days a week. The Mine employs approximately 130 personnel across its operations, including in the mining, administration and maintenance areas. Current manning rosters are three by eight hour 10 minute shifts per day Monday to Friday, with additional overtime worked on weekends. A range of real time and predictive monitoring is undertaken at the Mine with the results regularly reviewed and reported annually to ensure the effective and transparent operation of management controls. The Proponent also actively maintains a Community Consultative Committee (CCC) and complaints register.

Subsequent to the exhibition of the Project EIS in November 2015, Bloomfield entered into an agreement to purchase the Integra Mine which lies to the immediate north of the Rix's Creek Mine. The interaction between these adjoining mines is described further in **Section 2.2.**

1.1.3 Existing Development Consent and Leases

Development consent for mining operations was first issued on 19 October 1989 for a period of 21 years from the date of approval. CL 352 was subsequently granted on 20 October 1989 (refer to **Table 1-1** for a summary of approvals history for the Mine).

The 1989 development consent allowed production of up to 0.3 Mtpa of raw coal for the first five years, increasing to 1.5 Mtpa in year six following commissioning of a CHPP. It also included surface (open cut) mining exclusions over certain sections of the lease area.

Following negotiations and agreement with the then landholders for the removal of the surface mining exclusion, a development application and supporting EIS were lodged with the Minister for Local Government and Minister for Planning in 1994, seeking consent for a modified mine plan to incorporate surface mining over the entire lease area. Additional infrastructure and equipment upgrades were also included to meet new technological operating standards. Development application (DA 49/94) was approved on 19 October 1995. Subsequently on 24 June 1998, ML 1432 was granted which enabled surface mining to occur over the whole lease area. The Mine will continue to operate under this approval (DA49/94) until 24 June 2019 or a new development consent under SSD_6300 is issued. Several modifications have however been made to DA 49/94 as detailed in **Table 1-1**.

Table 1-1 History of Development Consents for the Existing Rix's Creek Mine Operations

Year	Approval and Consent Authority	Activity
1989	Minister for Local Government and Minister for Planning	Construction and operation of a surface coal mine, associated transport and coal loading facilities, including CHPP. Consent was granted to mine up to 1.5 Mtpa of ROM coal. CL 352 was subsequently granted on 20 October 1989.
1995	DA 49/94 - Minister for Urban Affairs and Planning.	Coal mining within CL 352 and on land subject to Coal Lease Application No. 17 in Singleton, construction and operation of surface coal mine and infrastructure and equipment upgrades. Total mine production capped at 15 million bank cubic metres of material movement.
1999	DA 49/94 Modification 1 – Minister for Infrastructure and Planning	Modification to amend applicable potentially affected lands monitoring requirements.
2003	DA 49/94 Modification 2 – Minister for Infrastructure and Planning	Modification to receive ROM coal from Glennies Creek underground mine, process the coal and transport by rail.
2004	DA 49/94 Modification 3 – Minister assisting the Minister for Infrastructure and Planning	Modification to receive process and transport bulk coal samples from the Bickham exploration project.
2009	DA 49/94 Modification 4 – Minister for Planning	Modification to allow a cut and cover tunnel under the New England Highway.
2013	DA 49/94 Modification 5 – Minister for Planning and Infrastructure	Modification to enable the construction and operation of a rail loop and associated clean coal stockpile and rail loading facility on the Rix's Creek Mine site.

Year	Approval and Consent Authority	Activity
2014	DA 49/94 Modification 6 – Minister for Planning	Modification of the total volume of material that can be moved annually from 15 million bank cubic metres to 16.1 million bank cubic metres.
2016	DA 49/94 Modification 7 – Minister for Planning	Modification to allow: • ROM coal from Integra Mine to be transported to Rix's Creek CHPP for processing; and • ROM coal from Rix's Creek Mine to be transported to Integra Mines CHPP for processing.
2016	DA 49/94 Modification 8 – Minister for Planning	Modification for the construction and use of two temporary ROM coal stockpile pads.
2017	DA 49/94 Modification 9 – Minister for Planning	Modification to allow Emplacement of material from Rix's Creek Mine to Integra.

1.2 Project Outline

The Proponent is seeking approval for the continuation of existing multi-seam benching open cut mining operations within CL 352 and ML 1432. The Project would allow the Mine to continue its open cut mining operations and utilisation of existing mine infrastructure to process up to 3.6 Mtpa ROM coal beyond the life of its current development consent, extending the life of mining until approximately 2038. It includes a new mine lease area (currently known as MLA 487) to the west of the existing mining lease to accommodate the proposed new overburden emplacement area. The Project includes all development existing within the Project boundary at the date of the approval of SSD_6300; and the continued use and maintenance (including associated ancillary activities) of all such development and associated activities. The Project Area is shown in **Figure 1-1.**

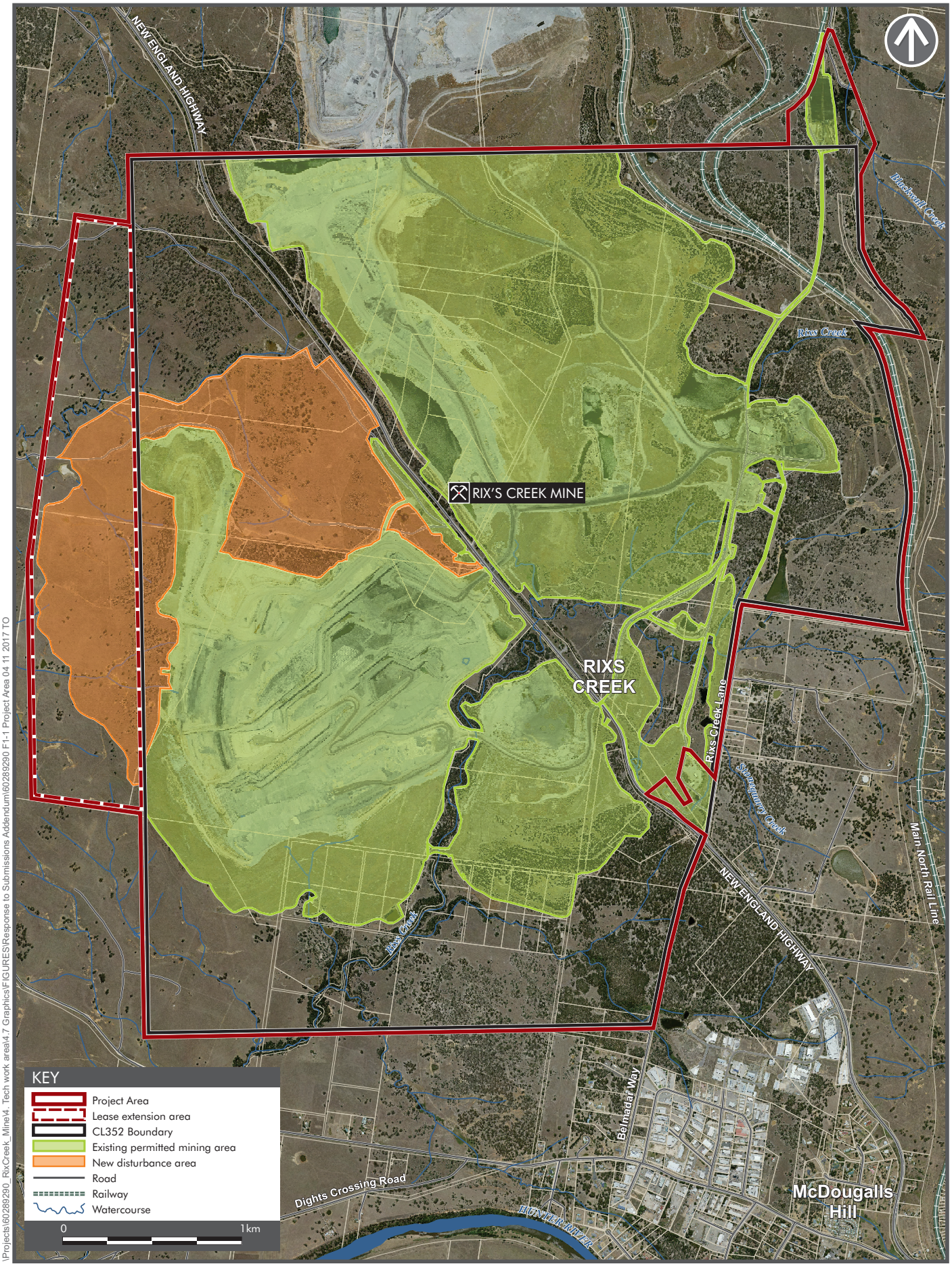
The proposed development would use open cut mining methods to extract coal from the Hebden, Barrett, Liddell, Arties, Pikes Gully and Lemington seams of the Whittingham Coal Measures within the bounds of CL 352 and ML 1432. Once the coal has been extracted, it would be processed at the Mine's existing CHPP and coal clearance facilities, and then transported via the approved existing Integra Mine rail loop for export customers and domestic customers.

The components of the proposed development include:

- Continuation of open cut mining of Pit 3 (West Pit) and future North Pit Area (in the Existing Permitted Mining Area) ;
- Reject and tailings disposal to approved emplacement areas;
- Establishment of new emplacement areas to facilitate the extension of Pit 3;
- Continued use of existing Mine access and surface facilities including:
  - CHPP;
  - Coal stockpiles;
  - Administration buildings and amenities;
  - Rail loading facilities and mine rail loop; and
  - Roads, dams, drains and utility easements.
- Continued rail transport of coal;
- Mine closure, final landform and rehabilitation;
- Water Management;
- Construction of an additional mine road crossing of the New England Highway;
- Those activities and operations approved under DA49/94 as modified; and

- A revised mining schedule as described in **Section 2.0**.

A detailed description of the Project can be found in Section 6.0 of the Environmental Impact Statement (EIS) prepared for the Project, and the proposed final landform is shown in **Figure 1-2.** This document takes precedence in respect of any inconsistency between the Project description in the EIS and that found in this document.



\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions Addendum\60289290 F1-1 Project Area 04 11 2017 TO

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Note: Existing mine infrastructure within the Project Area yet external to the Existing Permitted Mining Area has been approved under separate development consents or is considered exempt and complying development pursuant to State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

PROJECT AREA

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 1-1

1.3 Overview of Approval Process and Exhibition

Approval for the Project is being sought as a State Significant Development (SSD) under Division 4.1, Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Project meets the SSD requirements set out in Schedule 1, Clause 5 of the *State Environment Planning Policy (State and Regional Development) 2011,* being development for the purpose of coal mining. The Project is declared to be an SSD for the purposes of the EP&A Act and the Minister for Planning is the approval authority. For large coal mining projects however, the Minister has delegated the planning approval powers to the NSW Planning Assessment Commission (PAC). The Project is subject to an assessment by the PAC under Division 4.1, Part 4 of the EP&A Act.

In accordance with the requirements of the EP&A Act, an Environmental Impact Statement (EIS) was prepared to assess the potential environmental impacts of the Project and to address the Director General's Requirements (DGRs) issued for the Project on 3 March 2014. The EIS was submitted to the Department of Planning and Environment (DP&E) in November 2015.

Section 89F of the EP&A Act and the *Environmental Planning and Assessment Regulation 2000* (the Regulation), requires the EIS to be placed on exhibition for not less than 30 days. The EIS for the Project was placed on public exhibition by DP&E between 3 November 2015 and 3 December 2015.

The EIS was made available on the DP&E web site (http://majorprojects.planning.nsw.gov.au/) and in hard copy at several locations for public viewing (further detail provided in **Section 2.0** of this report). Hard copies were also provided to key stakeholder agencies for exhibition or review purposes, including:

- NSW DP&E;
- Singleton Council;
- NSW Department of Primary Industry (DPI);
- NSW Department of Primary Industry - NSW Office of Water;
- NSW Department of Industry – Division of Resources and Energy (Now Department of Planning and Environment – Resources and Energy, Division of Resources and Geoscience);
- NSW Environment Protection Authority (EPA);
- NSW Office of Environment and Heritage (OEH);
- Heritage Division, NSW - OEH;
- Hunter New England Population Health;
- Roads and Maritime Services (RMS); and
- Nature Conservation Council.

1.4 Purpose of this Report

During the exhibition of the EIS, 140 submissions were made. In accordance with clause 85A of the EP&A Regulation, the DP&E provided copies of the submissions to the Proponent, and requested the preparation of a report detailing a response to the issues raised in the submissions. In October 2016, a Response to Submissions Report (AECOM, 2016) (original Response to Submissions Report (RTS)) was prepared to detail and provide responses to issues raised in the submissions received during the EIS exhibition period.

The following matters related to the project have occurred since the completion of the EIS exhibition period:

- Government agencies and the DP&E requested further clarifications on the EIS;
- Bloomfield Collieries Pty Ltd and DP&E agreed to consent orders at the Land and Environment Court of New South Wales in regard to a compliance matter, which has required additional assessment to complement the EIS in particular in relation to biodiversity and offset credit calculations (refer to **Section 2.1**); and

- The project description has been updated to make necessary amendments as a result of the purchase of the Integra Mine by Bloomfield Collieries Pty Ltd (refer to **Section 2.2**) and to remove the diversion of Stonequarry Gully (refer to **Section 2.3**).

These matters have necessitated the preparation of this Revised Response to Submissions Report (RRTS). The purpose of this RRTS is to provide a consolidated document which details:

- The response to the issues raised in the submissions received during the exhibition period as provided in the original Response to Submissions Report;
- The response to issues raised outside of the exhibition period by the EPA and the DP&E;
- A description of project implications and additional assessment undertaken following the resolution of a compliance matter with the DP&E; and
- A description of updates to the project following the completion of the EIS exhibition period.

Terminology used in this RRTS

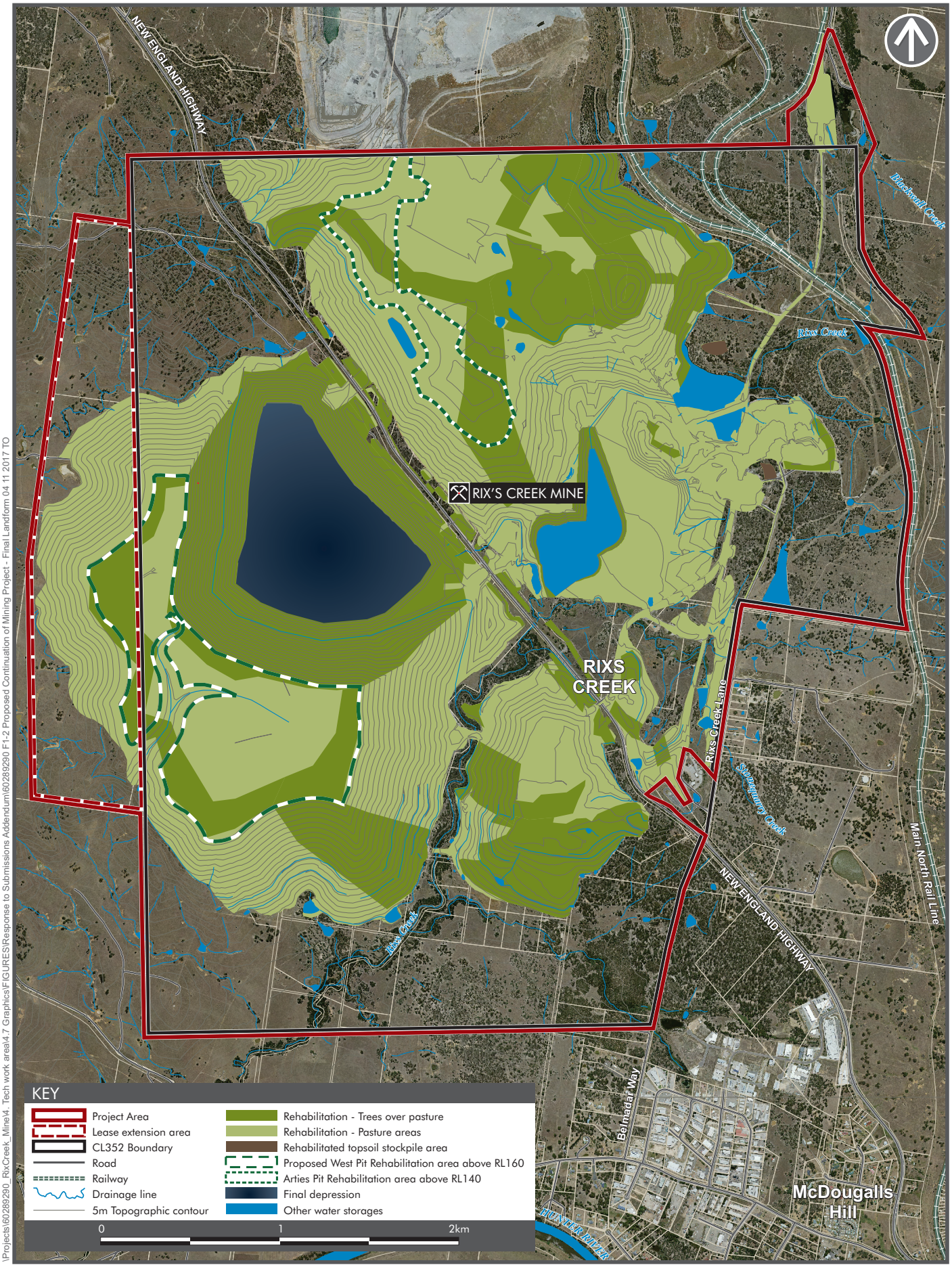
To clarify the terms used in this RRTS compared to the previous EIS and RTS, the following definitions have been applied to this RRTS:

- **Project Area**: This is the area within which the entire Project is situated (refer **Figure 1-1**;
- **Existing Permitted Mining Area:** The area of land on which Bloomfield has approval to undertake mining activities under its existing development consent DA 49/94 (refer **Figure 1-1**); and
- **New Disturbance Area:** This is the area which will be disturbed by the Project outside the Existing Permitted Mining Area (refer **Figure 1-1**).

1.5 Structure of this Report

The RRTS Report is structured as follows:

- **Section 1 -** provides an overview of the Project, the EIS process and the RRTS Report purpose and structure.
- **Section 2 -** provides a description of amendments made to the Project subsequent to the public exhibition of the EIS.
- **Section 3** – provides a summary of the additional environmental assessment undertaken for the Project.
- **Section 4 -** provides a summary of the community engagement activities that were undertaken during the preparation and exhibition of the EIS.
- **Section 5 -** provides a summary of the submissions received, and an outline of the issues raised by Government agencies, Singleton Council, key stakeholders (interest groups / organisations) and individuals.
- **Section 6 -** provides responses to the issues raised in submissions received from Government agencies and Singleton Council.
- **Section 7 -** provides responses to the issues raised in submissions received from community stakeholders (organisations and individuals).
- **Section 8 -** presents a revised set of Project management and mitigation measures that have been reviewed following consideration of the submissions as detailed in this report.
- **Section 9 –** concluding statements and the process following the submission and review of the RRTS.
- **Appendices -** includes submissions received during the exhibition period and additional technical reporting compiled in response to those submissions and the revised mining schedule.



\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions Addendum\60289290 F1-2 Proposed Continuation of Mining Project - Final Landform 04 11 2017 TO

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PROPOSED CONTINUATION OF MINING PROJECT - FINAL LANDFORM

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 1-2

2.0 Project Update

2.1 Compliance Matters

During the assessment of the EIS, DP&E identified a potential discrepancy between the proposed disturbance area identified in the Project EIS and the disturbance area identified in the environmental assessment that accompanied the development application for DA 49/94. Subsequent action was undertaken by DP&E to define the Existing Permitted Mining Area and therefore enable the impacts of the Project to be accurately defined and assessed. In order to provide full disclosure of these events, the background, outcomes and the identified need for additional impact assessments to ensure the Project has been comprehensively addressed, are discussed below.

2.1.1 Background

Rix's Creek Mine operates pursuant to the development consent, DA No. 49/94 (Development Consent), granted by the Minister for Urban Affairs and Planning for the Rix's Creek Mine on 16 October 1995. Condition 1 of Schedule 2 of the development consent provides:

'The Development is to be carried out generally in accordance with the:

*i. Environmental Impact Statement prepared by Enviros*ciences Pty Limited, dated November 1994;*

*ii. Supplementary Document prepared by Enviros*ciences Pty Limited, dated April 1995;*

Bloomfield and the DP&E have recently had reason to review the historical mining operations undertaken by Bloomfield at the Rix's Creek Mine together with the administration of the development consent applying at the site by the DP&E over that period.

DP&E formed the view that various mining operations at Rix's Creek Mine were not carried out in accordance with the development consent. Rix's Creek Mine had at all times reported the carrying out of such mining operations to DP&E but in the interests of reaching a resolution on the issue that would not delay this application, agreed to consent orders under the EPA Act and an enforceable undertaking under the Mining Act 1992 to rectify the issue. It was resolved that the development consent area, now known as the Existing Permitted Mining Area is that shown on **Figure 1-1.**

2.1.2 Outcomes

Given the above, this document clarifies and confirms that approval is being sought under SSD_6300 for all existing and proposed mining and ancillary activities within the following:

- Existing Permitted Mining Area approved under DA 49/94;
- Existing mine infrastructure inside the Project Area but external to the Existing Permitted Mining Area including but not limited to power lines, water management system, highway crossings, rail loading infrastructure and communication infrastructure; and
- Inside the New Disturbance Area.

The mining area east of the New England Highway (NEH) is included within SSD_6300 but DP&E has confirmed that DA49/94 permitted disturbance inside this area therefore this area does not need to be assessed for disturbance impacts.

The Project Area, the Existing Permitted Mining Area and the New Disturbance Area are shown on **Figure 1-1**. As described in **Section 2.1.3**, additional work has been undertaken to ensure all disturbance proposed by the Project has been fully and comprehensibly assessed in this RRTS.

2.1.3 Additional Assessment

Subsequent to the identification of the New Disturbance Area as agreed by DP&E, Bloomfield undertook a gap analysis of the Project EIS, accompanying specialist assessments, and the previously submitted RTS, to determine if additional assessment as a result of the New Disturbance Area was required. **Table 2-1** provides an analysis of the specialist assessments prepared for the EIS and subsequent updates for the RTS, and a determination as to whether additional assessment would be

required to ensure the New Disturbance Area has been thoroughly assessed. Reference is made to the Project Area, Existing Permitted Mining Area and New Disturbance Area as shown on **Figure 1-1**.

Following the gap analysis, Bloomfield identified that the following specialist assessments required review or updating to ensure that the New Disturbance Area has been comprehensively assessed:

- Biodiversity Impact Assessment, which formed Appendix I to the Project EIS;
- Agricultural Impact Assessment, which formed Appendix O to the Project EIS; and
- Aboriginal Archaeological and Cultural Heritage Impact Assessment, which formed Appendix K to the Project EIS.

Bloomfield has undertaken subsequent reviews of these specialist assessments to ensure the Project Area has been fully assessed. The outcomes of these reviews are detailed in **Section 3.0.**

Table 2-1 Review of Specialist Assessments

Specialist Report			Comment
EIS	RTS	RRTS	
Ecology Report for the Continuation of Rix's Creek Mine, Singleton LGA (Eastcoast Flora Survey, 2014) (EIS Appendix I)	Assessment area remained unchanged from that detail in the EIS. Clarification provided in regards to areas of vegetation communities impacted and credit Upper Hunter Strategic Assessment (UHSA) credit calculations.	Existing ecological assessment reviewed and impacts redefined for the New Disturbance Area. Offsetting credit requirements updated and calculated for both BCAM (UHSA) and FBA methodologies. Refer **Appendix B.**	Additional assessment has been undertaken as detailed in **Section 3.2.**
Rix's Creek Continuation of Mining Aboriginal Cultural Heritage Assessment (AECOM, 2014 (EIS Appendix K)	Assessment included areas within both the Existing Permitted Mining Area and New Disturbance Area. EIS report remains valid.	No change, EIS report remains valid. Additional summary report prepared (Refer **Appendix C)** to confirm entire Project Area has been fully surveyed.	To confirm the New Disturbance Area has been fully assessed and to identify which Aboriginal heritage items have been identified in the New Disturbance Area the existing Aboriginal Heritage Assessment has been reviewed as detailed in **Section 3.4.**
Air Quality Impact Assessment, Rix's Creek Continuation of Mining Project (Todoroski Air Sciences, 2015) (EIS Appendix L)	Study area and receiver locations remained unchanged from the EIS. Clarifications provided in response to agency comments. EIS report remains valid.	Study area and receiver locations remained unchanged from the EIS and RTS. Clarifications provided in response to agency comments.	Potential air quality impacts have been fully assessed.
Rix's Creek Continuation of Mining Environmental Noise Assessment (Global Acoustics, 2015) (EIS Appendix M)	Study area and receiver locations remained unchanged from the EIS. Clarifications provided in response to agency comments. EIS report remains valid.	Study area and receiver locations remained unchanged from the EIS and RTS. Clarifications provided in response to agency comments.	Potential noise impacts have been fully assessed.
Rix's Creek Pty Ltd Effects of Blasting in the Continuation Area (Terrock Consulting Engineers, 2014) (EIS Appendix N)	Study area and receiver locations remained unchanged from the EIS. Clarifications provided in response to agency comments. EIS report remains valid.	Study area and receiver locations remained unchanged from the EIS and RTS. Clarifications provided in response to agency comments.	Potential blasting impacts have been fully assessed.

Specialist Report			Comment
EIS	RTS	RRTS	
Agricultural Impact Statement (Nelson, 2014) (EIS Appendix O)	This assessment only assessed part of the New Disturbance Area	Additional assessment has been undertaken to assess the balance of the new disturbance area. Refer **Section 3.3** and **Appendix D.**	Potential impacts to agricultural activity have been fully assessed.
Soil and Land Impact Assessment (SLR, 2014) (EIS Appendix P)	This report covers the majority of the New Disturbance Area however was prepared in support of the Biophysical Strategic Land verification for the mine lease continuation area which it fully assesses.	No change, EIS report remains valid.	Potential impacts to agricultural activity have been fully assessed by the Agricultural Impact Statement..
Rix's Creek Mine Rehabilitation Strategy (AECOM, 2015) (EIS Appendix Q)	Proposed rehabilitation strategy would be applied regardless of New or Existing Permitted Mining Area. EIS report remains valid.	No change, EIS report remains valid.	The rehabilitation strategy would continue to be applied across the Mine as proposed.
Surface Water Impact Assessment (JP Environmental, 2014) (EIS Appendix R)	Study area and receiver locations remained unchanged from the EIS. Clarifications provided in response to agency comments. EIS report remains valid.	Study area remained unchanged from the EIS and RTS. Clarifications provided in response to agency comments.	Potential surface water impacts have been fully assessed.
Groundwater Impact Assessment (RPS, 2014) (EIS Appendix S)	Study area and receiver locations remained unchanged from the EIS. Clarifications provided in response to agency comments. EIS report remains valid.	Study area remained unchanged from the EIS and RTS. Clarifications provided in response to agency comments.	Potential groundwater impacts have been fully assessed.
Rix's Creek Continuation of Mining Project Historic Heritage Impact Assessment (AECOM, 2014 (EIS Appendix T)	Assessment covered all historical and potentially historical heritage items in the Project Area. EIS report remains valid.	No change, EIS report remains valid.	Potential historic heritage impacts have been fully assessed.
Traffic Impact Assessment (AECOM, 2015) (EIS Appendix U)	Disturbance area not applicable to traffic assessment. EIS report remains valid.	No change, EIS report remains valid.	Potential traffic impacts have been fully assessed.

Specialist Report			Comment
EIS	RTS	RRTS	
Social Impact and Opportunity Assessment (Umwelt, 2015) (EIS Appendix V)	Disturbance areas not applicable to Social Assessment. EIS report remains valid.	No change, EIS report remains valid.	Potential social impacts have been fully assessed.
Economic Impact Assessment (KPMG, 2014) (EIS Appendix W)	Report updated to reflect new mine schedule, updated coal price, labour and externality assumptions and provide revised cost-benefit analysis.	No change, EIS report remains valid as updated in the RTS. RRTS includes clarification of response to CIE peer review.	Potential economic impacts have been fully assessed.
Landscape Character and Visual Amenity Assessment (RPS Insights, 2014) (EIS Appendix X)	Study area and receiver locations remained unchanged from the EIS. Clarifications provided in response to agency comments. EIS report remains valid.	No change, EIS report remains valid. Clarifications provided in response to agency comments.	Final landform and dump height remains consistent with that originally proposed.

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2.2 Integra Mine Purchase

Subsequent to the exhibition of the Project EIS in November 2015, Bloomfield Collieries Pty Ltd entered into an agreement to purchase the Integra Mine which lies to the immediate north of the Rix's Creek Mine, sharing common mining lease and property ownership boundaries. The Integra complex also included an underground mine however this was purchased separately by Glencore and has become a separate operation on a separate lease area. Following the purchase, the Integra Mine is now known as the Rix's Creek North (RCN) Open Cut Mine. To avoid confusion, this RRTS will continue to refer to RCN as Integra.

The Integra Mine ceased operation and was placed in care and maintenance in August 2014 by its former owners. Since purchasing the Integra Mine, Bloomfield has recommenced mining on the site. The Integra Mine has a maximum approved production level of 6 Mtpa ROM coal, and after recommencing operations exported its first coal during June 2016.

The purchase of the Integra Mine included the following elements:

- Mining tenements;
- Integra Complex Coal Handling Preparation Plant;
- Rail Loop; and
- Open cut mobile plant including:
    - 5 Overburden Drills;
    - 4 Large Excavators;
    - 3 Large Front End Loaders;
    - 25x180T Rear Dump Trucks;
    - 10 Large Bulldozers;
    - 3 Mine Graders; and
    - 3 Water Carts.

The Integra Mine operates in accordance with its own Project Approval 08_0102 issued under Part 3A (repealed) of the EP&A Act.

2.2.1 Rix's Creek North Relationship with Rix's Creek

The Rix's Creek Mine and Integra Mine were under separate project approvals, EPLs and environmental management systems. Bloomfield took possession of Integra Mine on 18 December 2015 and has since taken Integra Mine out of care and maintenance and into production.

Bloomfield is progressing with the integration of the Integra Mine operation into a combined operation. All employment opportunities resulting from re-commencement of Integra Mine production have been as Rix's Creek Mine employees under the management of Rix's Creek Mine. To assist with gaining the best possible operational efficiencies, Bloomfield has worked with the regulatory authorities to achieve a combined EPL, updated environmental management plans and current development consent modifications that allow for the most efficient utilisation of the CHPPs on each mine site. Glencore and Bloomfield had a development consent modification approved on 23 August 2016 to allow the separation of the Integra Complex development consent into separate Open Cut and Underground development consents.

Bloomfield manage the integrated mines to ensure the separate development consent conditions on each site are adhered to. For the purpose of determining the Rix's Creek Continuation of Mining Project, the current Integra Mine development consent is outside the scope of this determination. For clarity, no combining of the Integra Mine development consent and the Rix's Creek Mine development consent is proposed as part of this Project. It should however be noted that Rix's Creek Mine DA 49/94 MOD 7 and Integra Mine Project 08_0102 MOD 5 granted 26 February 2016 allows Rix's Creek Mine ROM coal to be transported to and processed at the Integra CHPP and railed from the Integra Mine rail loading facility, and Integra Mine ROM coal to be transported to and processed at the Rix's

Creek Mine CHPP and railed from the Rix's Creek rail loading facility. These approvals would be maintained for the Project.

2.2.2 Project Amendments as a Result of Integra Mine Purchase

Whilst the Rix's Creek Mine and Integra Mine operate under separate approvals, synergies between the two operations have allowed Bloomfield to re-evaluate elements of the proposed Project. This has presented Bloomfield with opportunities to enhance mine site production, while improving environmental performance and social and economic outcomes. For example Bloomfield no longer requires the security of a separate rail approval for the Rix's Creek Mine, and the Project mine schedule is now able to be adjusted to account for the new coal resource obtained by Bloomfield at Integra Mine. These and other synergies are discussed further below.

Rix's Creek Mine Rail Loop (DA49/94 Modification No. 5) – No Longer Required

The Mine currently uses the Integra Mine Rail Loop to export coal from site. Bloomfield has historically had access to the Integra Mine Rail Loop through an access agreement with the previous owners of the Integra Mine. For commercial reasons and to ensure Rix's Creek Mine would always have access to a rail loop, Bloomfield had previously sought approval to construct its own rail loop to enable it to operate independently of Integra Mine. In November 2013, Bloomfield was granted approval (DA 49/94 MOD 5) to construct a stand-alone rail loop at Rix's Creek Mine.

With the purchase of the Integra Mine and associated rail loop there is no longer a need to construct a rail loop at Rix's Creek Mine. Therefore as part of this Project, Bloomfield now commits to the surrender of the rail loop approval. This would mean that potential impacts predicted as a result of the construction and operation of the rail loop, as incorporated into the EIS, would not occur. Further, biodiversity offsets required to be provided under DA49.94 MOD 5 no longer need to be provided.

Amendment of Proposed Project Mine Schedule – Reduced Peak Production

Bloomfield has taken initial steps to integrate the Integra Mine and Rix's Creek Mine into its overall customer demand calculations. The current designed production levels for the Integra Mine are 2.2 Mtpa ROM coal. The utilisation of the Integra Mine resource means that following closure of the Bloomfield Open Cut Mine at East Maitland, the planned maximum production levels from the Rix's Creek Mine can be reduced during the peak years of 2021 to 2025, and still allow for the fulfilment of long term customer requirements. The mine schedule for the Project has therefore been amended to reflect these changes. Instead of mining up to 4.5 Mtpa ROM coal over the three year period 2021 – 2023 (as originally proposed in the EIS), a lower annual maximum of 3.6 Mtpa ROM coal would be mined over the five year period 2021 – 2025. All other scheduled production years remain unchanged. The adjusted indicative production rates over the life of the Project are presented in **Table 2-2** with the production rates that were included in the EIS for comparison.

Table 2-2 Adjusted Indicative Production Rates over the Life of the Project

Years	ROM Coal (Mtpa)		Saleable Coal (Mtpa)	
	EIS Rate	Adjusted Rate	EIS Rate	Adjusted Rate
2017 - 2020	2.5	2.5	1.5	1.5
2021 - 2023	4.5	3.6	2.7	2.2
2024 - 2025	1.6	3.6	1.0	2.2
2026 - 2028	1.6	1.6	1.0	1.0
2029 - 2032	1.5	1.5	0.9	0.9
2033 - 2036	1.0	1.0	0.6	0.6
2037	0.8	0.8	0.5	0.5

Environmental Impact – Overall Impacts Reduced

Whilst the Project disturbance area would remain unchanged, a reduction in the maximum production levels for the Project would result in subsequent reductions in the noise and air quality impacts experienced as a result of the Project during peak production times. The amended production rate would see modified (reduced) environmental impacts, particularly in relation to air quality and noise. These are discussed in detail in the relevant sections of this RRTS report.

Current designed production levels for the Integra Mine are 40% of the approved maximum production levels. This has allowed Bloomfield to integrate a large percentage of the acquired mobile plant and critical spare parts into its Rix's Creek Mine, Bloomfield Mine and Four Mile Workshop fleets. The immediate integration of the noise attenuated rear dump trucks, excavators, drills and front end loaders (now surplus to the Integra Mines' requirements) effectively results in earlier implementation of key noise control measures. This would effectively reduce noise emission in the earlier stages of the Project.

Social / Economic Impact

The social impact as a result of the amended Project would be largely unchanged. There would be a reduction in the maximum employment levels during the period of maximum production. Maximum employment levels were previously estimated (Section 6.8 of the EIS) to be 234 during the period of maximum production. Smoothing of the maximum production levels during 2021 – 2025 would result in maximum employment levels of 217. There would be no reduction in total roster hours over the 5 year peak period, with no resultant change to total wages obtained by the Mine employees. It is noted that the recommencement of production operations within the Integra Mine has currently enabled employment of an additional 80 employees.

As noted above, noise and air quality impacts would be reduced as a result of the lower maximum peak production levels, and this would benefit the local community where potential impacts are anticipated.

The economic impacts of the integration of Rix's Creek Mine and Integra Mine have also been assessed, and are further discussed in **Section 7.15**. Key benefits associated with the purchase of the Integra Mine include:

- Mobile plant replacement costs reduced by the utilization of excess Integra Mine mobile plant;
- Large inventory of mobile plant critical spare parts reduces repair and maintenance costs in the early years of the Project;
- Reduction in management costs with Integra Mine production effectively spreading corporate costs across increased production levels; and
- Acquisition of the Integra Mine Rail Loop, removing the access costs to use the rail loop that Rix's Creek had been paying to Integra Mine.

Rehabilitation – a more co-ordinated approach

Rix's Creek Mine has a well-established rehabilitation program, which includes short, medium and long term measures to achieve the overall rehabilitation objectives for the site.

Under a Department of Mineral Resources 1998 Approval to mine the Barrier Pillar between Rix's Creek Mine and Integra Open Cut Mines, both mines had responsibility for co-establishment of the final landform in this area. The majority of this final landform is currently formed and stable. The integration of the final landform design and rehabilitation of this area under Rix's Creek Mine management will continue.

In the future the Rix's Creek Mine rehabilitation Management Plan and the Integra Mine Rehabilitation Management Plan would be integrated into a single management plan.

2.3 Stonequarry Gully – No Longer Impacted

Following further consideration by the Proponent, the diversion of Stonequarry Gully as proposed in the EIS has been removed from the Project and approval is no longer being sought for this part of the Project. This diversion was originally proposed in order to provide access to a coal resource of approximately 300,000 tonnes of product coal. The resource would require reasonable movements of overburden at a greater than 10:1 ratio (BCM of overburden per tonne of product coal) and would not be required until approximately 18 to 20 years into the Project's proposed lifespan.

At the time of required extraction this resource may no longer be economical, or may not be required to satisfy Bloomfield customer requirements in the future. Should changes to the operation in the future make it desirable to access this resource, Bloomfield would enter into a separate approval or development consent modification process to obtain the approvals necessary for the Stonequarry Gully diversion.

2.4 Project Boundary Adjustment

January 2012 RMS requested acquisition of part of Lot 4 in Deposited Plan (DP) 1123099 and part Lot 40 D.P. 1014997 to allow the transfer and upgrade of the Rix's Creek RMS Rest Area. This facility had previously been situated within the New England Highway road verge adjacent to the RMS Bridge over Rix's Creek. The situating of the upgraded facility, on land acquired from Bloomfield, allowed the road access to utilise the Rix's Creek Lane approved intersection, which greatly improved the access for large vehicles. A revised schedule of land parcels that make up the Project Area is attached at **Appendix A.**

3.0 Additional Assessment Information

3.1 Review of Existing Assessments

As a result of the gap analysis discussed in **Section 2.1.3**, Bloomfield engaged a project ecologist and agricultural specialist to undertake an assessment of the impact of the Project on the New Disturbance Area. In addition a review was also undertaken of the historical and archaeological heritage assessment previously undertaken for the Mine to confirm the Project Area has been suitably assessed. The outcome of these assessments is detailed in the following sections:

- Ecology – **Section 3.2**;
- Agriculture – **Section 3.3**; and
- Heritage – **Section 3.4**.

Whilst DP&E did not have questions regarding the applicability of other completed assessments as they relate to the New Disturbance Area, it posed additional questions resulting from the ongoing reviews of the information previously provided. These questions are addressed in the following sections:

- Air Quality – **Section 6.4.8**;
- Economic Assessment – **Section 7.15.7**;
- Surface Water – **Section 7.10.2**;
- Final Landform – **Section 7.13.2**
- Visual Impact Mitigation – **Section 7.13.2**
- Blasting – **Section 7.5.2**; and
- Waste Generation – **Section 7.16.1**.

3.2 Biodiversity Impact Assessment

The Project EIS included an ecological assessment *Ecology Report for the Continuation of Rix's Creek Mine, Singleton LGA*, Revision 4.4, October 2015 (EIS biodiversity assessment) completed by Eastcoast Flora Survey. This report was summarised in Section 13.0 of the EIS and attached at Appendix I. The EIS biodiversity assessment and the associated fieldwork and site surveys were prepared in accordance with the Biodiversity Certification Assessment Methodology (BCAM). This was undertaken to allow for the Project biodiversity impacts to be offset in accordance with the Upper Hunter Strategic Assessment (UHSA).

Since the preparation of the EIS biodiversity assessment the following occurred:

- The Office of Environment and Heritage (OEH) raised a number of questions in regards to the findings of the assessment; and
- As a result of the compliance matters detailed in **Section 2.1**, and the identification of the New Disturbance Area, elements of the EIS biodiversity assessment pertaining to the area assessed in that report became redundant.

To overcome the issues associated with the area assessed in the EIS biodiversity assessment, Bloomfield engaged EMM Consulting (EMM) to undertake a review of the biodiversity assessment and determine impacts to the New Disturbance Area. A copy of this assessment is provided at **Appendix B** and summarised below. Due to the identification of the New Disturbance Area following OEHs review of the EIS a number of questions in their submissions to the exhibition of the EIS have been addressed in the updated assessment. In so far as they remain applicable a response to these questions is provided in **Section 6.7.**

3.2.1 Review of Biodiversity Assessment

Following agreement with DP&E in regards to the compliance matter described in **Section 2.1**, Bloomfield engaged EMM to undertake an assessment of the biodiversity values of the newly defined New Disturbance Area. EMM utilised the information collected by Eastcoast Flora Survey during 2013 and reviewed this information as it applied to the New Disturbance Area to verify the biodiversity characteristics of the New Disturbance Area. As described in Section **Appendix B** additional survey effort was undertaken to validate the existing data and also to ensure that the level of site assessment undertaken was consistent with the requirements of both the BCAM and FBA assessment methodologies for calculating offsets. This enabled EMM to calculate the revised Project offset credits as described in **Section 3.2.2.**

During the original survey by Eastcoast Flora, the potential for Pine Donkey Orchid (*Diuris tricolor*) was identified and therefore targeted surveys where undertaken. No individuals where identified during these initial surveys. A small sub-population of the species has recently been recorded near Belford, located south-east of the Project Area. This effectively increases the known range of the species and increases the likelihood of the species occurring within the project Area. For this reason additional targeted surveys for the species were conducted during October 2017. No Pine Donkey Orchids observed within the Project Area during the most recent targeted survey.

No other populations, communities or species were found to warrant the need for further assessment or targeted survey.

3.2.2 Revised Credit Calculations

In order to determine the required offset credits for the New Disturbance Area the offsetting calculations where undertaken utilising two separate methodologies:

- Assessment under the Biodiversity Certification Assessment Methodology (BCAM) in accordance with the BioCertification Operation Manual (OEH, 2015), as used to determine offsetting requirements under the UHSA; and
- The Framework for Biodiversity Assessment (FBA) in accordance with the Framework for Biodiversity Assessment: Offsets Policy for Major Projects (OEH, 2014)

Details of how each of the credit calculation's meets the individual requirements of each methodology is provided in **Appendix B.** Undertaking the assessment under two separate methodologies would allow the FBA methodology to be utilised in the event that the UHSA does not proceed. Both assessments were undertaken by an accredited assessor, Eugene Dodd (Accreditation number 191). The results of each assessment are described below.

Upper Hunter Strategic Assessment - BCAM

Revised calculations undertaken for the new disturbance area project footprint were based on the original survey work undertaken for the *Upper Hunter Strategic Assessment* (Bell 2014). Vegetation types and areas were calculated from shapefiles and plot data provided by Dr Stephen Bell (Eastcoast Flora Survey). A review of the plots and transects completed for the Rix's Creek Continuation Project by EMM found that there were a sufficient number to meet the assessment requirements, despite the increase in the area of several vegetation communities. One minor amendment was made, with regeneration figures originally entered as percentages rather than decimals. This has been updated. These calculations build on work for the wider Rix's Creek Mine development conducted by Colin Driscoll of Hunter ECO, which have previously been audited by Paul Hillier of OEH.

A comparison of each vegetation zones, their areas within the Project Area and the credits generated for each vegetation zone under the original and the new disturbance area is provided in **Table 3-1**. The full output of the landscape scores and credits generated for each vegetation zone, based on the revised credit calculations, is provided in **Table 3-2**. In addition, the electronic files will be provided to OEH to verify these findings.

Table 3-1 BioCertification Credits

Vegetation zone details	Original vegetation zone (ha)	Revised vegetation zone (ha)	Discrepancy (ha)	Original credits required	Revised credits required	Credit Change
HU812_Moderate/Good_Zone 1 Forest Red Gum grassy open forest on floodplains of the lower Hunter	0.81	0.22	-0.59	29	8	-21
HU906_Moderate/Good_Zone 2 Bull Oak grassy woodland of the central Hunter Valley	0.10	0.10	0.00	2	2	0
HU945_Moderate/Good_Zone 3 Swamp Oak - Weeping Grass grassy riparian forest of the Hunter Valley	0.36	0.00	-0.36	11	0	-11
HU819_Moderate/Good_Zone 4 Narrow-leaved Ironbark - Native Olive shrubby open forest of the central and upper Hunter	21.25	17.62	-3.63	606	503	-103
HU962_Moderate/Good_Zone 5 Grey Box grassy open forest of the Central and Lower Hunter Valley	1.01	0.76	-0.25	25	19	-6
HU819_Low_Zone 7 Narrow-leaved Ironbark - Native Olive shrubby open forest of the central and upper Hunter Derived Grassland	195.49	194.09	-1.41	3,385	3,361	-24
Total	**219.02**	**212.79**	**-6.24**	**4,058**	**3,893**	**-165**

*Note that in addition to the area changes, the credit discrepancy is partially driven by a correction of the regeneration values in the calculator. These were previously inputted as a percentage rather than a decimal.

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Table 3-2 BioCertification Credits and Landscape Scores

Vegetation zone details	Vegetation zone area	Percent cleared value	EEC	Red Flag	Loss of SV score	LV score (certification area)	Landscape Tg value	Area of veg zone certified	Number of credits required	Gain SV score offset	10 percent good mgmt (offset)	LV score offset
Entire area												
HU812_Moderate/Good_Zone 1 Forest Red Gum grassy open forest on floodplains of the lower Hunter	0.22	0	Yes	Yes	72.40	16	0.56	0.22	8	15.60	7.24	21
HU906_Moderate/Good_Zone 2 Bull Oak grassy woodland of the central Hunter Valley	0.10	53	No	Yes	47.92	16	0.57	0.10	2	16.08	4.79	21
HU819_Moderate/Good_Zone 4 Narrow-leaved Ironbark - Native Olive shrubby open forest of the central and upper Hunter	17.62	32	Yes	Yes	56.60	16	0.58	17.62	503	14.40	5.66	21
HU962_Moderate/Good_Zone 5 Grey Box grassy open forest of the Central and Lower Hunter Valley	0.76	0	No	Yes	45.83	16	0.56	0.76	19	19.17	4.58	21
HU819_Low_Zone 7 Narrow-leaved Ironbark - Native Olive shrubby open forest of the central and upper Hunter Derived Grassland	194.09	32	Yes	No	30.73	16	0.58	194.09	3,361	19.27	3.07	21
Total	**212.79**								**3,893**			

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Framework for Biodiversity Assessment (FBA)

An assessment under the *Framework for Biodiversity Assessment: NSW Offsets Policy for Major Projects* (FBA) (OEH 2014) is the preferred alternative for offsetting Project impacts should the UHSA not be available. The FBA uses the BioBanking Credit Calculator for major projects, which comprises slightly different inputs and outputs to the BCAM and therefore arrives at different credit calculations. This section provides the methodology used to undertake the FBA credit calculation and presents the resulting credit differences between the BCAM and FBA mechanisms.

Existing data and maps from the previous BCAM calculation were used to complete calculations in the BioBanking credit calculator for major projects. Vegetation types and areas were calculated from shapefiles and plot data provided by Dr Stephen Bell (Eastcoast Flora Survey) as collected as part of the EIS biodiversity assessment.

Method

Several key differences exist between the BCAM and BioBanking calculators. This section outlines the methods used for the BioBanking Calculator, where the inputs differ to that of BCAM.

Percentage native vegetation cover, connectivity widths and patch sizes were calculated using the Greater Hunter Native Vegetation Mapping V4 (OEH, 2012) as a baseline. This maintains consistency with the previous work conducted to date. Key differences are presented in **Table 3-3.**

Table 3-3 Approach to BioBanking Calculations Compared to the BCAM Method

Input	Approach	Reason required
Landscape Score		
Percentage native vegetation cover	500 ha inner and 5000 outer assessment circles were used.	BCAM uses a single 2000 ha assessment circle.
Connectivity value class	No connectivity value classes were identified within the project area. Therefore the width of vegetation corridors were calculated prior to development and after development.	Different connectivity value options required within BCAM.
Woody vegetation types	Connectivity corridors were assessed based on averaging of the plot data. The foliage cover recorded was compared to benchmark data for the PCT.	Not required in BCAM.
Patch size	Calculation of patch size for entire project.	Verified that the adjacent remnant area used in BCAM (501 ha) is consistent with patch size under the FBA.
Vegetation Zones		
Patch size	Patch size was calculated for each vegetation community.	This step is not required under BCAM.
Site Values		
Plot data	EMM utilised plot data collected for the BCAM assessment. Six addition plot and transects were also conducted by EMM during October 2017 due to splitting of Vegetation Zone 7 into EPBC Act listed and non EPBC Act listed CHVEFW (see below). The plot and transect data collected are provided in **Appendix B.**	The number of vegetation plots under BCAM is less than required under the FBA. In addition Zone 7 was split into two, to enable those areas listed as EPBC listed EECs to be distinguished.
Threatened species survey results	Additional targeted surveys have been conducted for the Pine Donkey Orchid (*Diuris tricolor*), refer **Appendix B**. Otherwise, species credit species have been assumed to have been	A new population of the Pine Donkey Orchid has been reported at Belford to the east of the Project Area, extending the

Table 3-3 Approach to BioBanking Calculations Compared to the BCAM Method

Input	Approach	Reason required
	adequately assessed as part of the original ecological report (East Coast Flora Survey, 2015).	known range of the species.

In addition, Zone 7 was split into two zones to enable those areas listed as EPBC Act listed Central Hunter Valley Eucalypt forest and woodland (CHVEFW) to be distinguished from areas not meeting the EPBC Act listing for CHVEFW.

Results

The landscape values entered into the BioBanking calculator and the corresponding scores generated are provided in **Table 3-4**.

Table 3-4 Landscape Values and Resulting Scores Using BioBanking Methodology

Landscape Value	Calculator input	Landscape score
Major Catchment Area	Hunter/Central Rivers	-
LGA	Singleton Shire Council	-
IBRA Sub-region	Hunter	-
Mitchell Landscape	Central Hunter footslopes	-
% vegetation cover outer assessment circle (5000 ha)	prior to development: 22.94% after development: 22.56%	0.75
% vegetation cover inner assessment circle (500 ha)	prior to development: 8.69% after development: 4.95%	0.75
Connectivity width	prior to development: >100-500m after development: 0-5 m	8
Overstory condition	prior to development: PFC < 25% of lower BM after development: no native over-storey	-
Understory condition	prior to development: PFC mid-storey/ground cover <50% lower BM after development: No mid-storey/ground cover	-
Patch size	501 ha (meets very large criteria for the Hunter CMA)	12
Assessment circle score	-	20.8

When the credits required for each community are considered individually, the credits increased between 36 and 100% (refer to **Table 3-5**). A full credit report is provided in **Appendix B** which details the range of potential offset options for each PCT impacted.

Table 3-5 BCAM and BioBanking Calculator Credit Outcomes

Vegetation zone details	Vegetation zone area (ha)	Credits required by BCAM calculator	Credits required under FBA	Credit difference
HU812_Moderate/Good_Zone 1 Forest Red Gum grassy open forest on floodplains of the lower Hunter	0.22	8	12	4 (50 %)
HU906_Moderate/Good_Zone 2 Bull Oak grassy woodland of the central Hunter Valley	0.10	2	4	2 (100 %)
HU819_Moderate/Good_Zone 4 Narrow-leaved Ironbark - Native Olive shrubby open forest of the central and upper Hunter	17.62	503	840	337 (67 %)
HU962_Moderate/Good_Zone 5 Grey Box grassy open forest of the Central and Lower Hunter Valley	0.76	19	27	11 (42 %)
HU819_Moderate/Good_derived grassland_Zone 7 Narrow-leaved Ironbark - Native Olive shrubby open forest of the central and upper Hunter	164.58	N/A	3,808	N/A
HU819_Moderate/Good_other_Zone 8 Narrow-leaved Ironbark - Native Olive shrubby open forest of the central and upper Hunter. (Part of the EPBC listed CHVEFW community)	29.5	N/A	764	N/A
Combined total of Zone 7 and Zone 8 – enabling comparison with BCAM calculations	*194.08*	*3,361*	*4,572*	*1211 (36 %)*
Total	**212.79**	**3893**	**5,455**	**1,562 (40 %)**

A total of 5,455 ecosystem were generated using the BioBanking credit calculator. This compares to 3,893 ecosystem credits generated by the BCAM calculator representing an increase of 40 %.

3.2.3 Management Measures

Despite the additional offset credits required to cover the Addendum Area, Bloomfield commits to implementing the mitigation and management measures in the Statement of Commitments (Refer **Section 8.0**) to address potential ecological impacts associated with the Project.

Bloomfield operations seek to avoid, reduce, mitigate and offset potential impacts to biodiversity by:

- Avoiding the removal of vegetation and habitat in Mine planning where reasonable and feasible;
- Reducing potential impacts on biodiversity through the staged removal of vegetation and habitat, together with the inspection of habitat trees before and during felling operations; and
- Mitigating impacts on biodiversity through measures contained in USHA *Guidelines for the Mitigation of Coal Mining Impacts on Biodiversity*;

Bloomfield has also prepared an offsetting strategy for impacts that cannot be avoided or fully mitigated. The offsetting strategy is detailed in **Appendix B** and incorporates the following steps to achieving the Projects required offsets:

1. Identifying if suitable credits are available on the market to meet offset requirements;
2. Finding potential on-site or off-site offset sites with the biodiversity values required to compensate for the project's impacts. Note that Bloomfield has already engaged ecologists to review their landholdings for potentially suitable offset sites;
3. In the absence of suitable offset credits or properties, applying the variation criteria rules of the FBA and finding suitable offsets to meet the requirements; and
4. Payment into the Biodiversity Conservation Trust.

It is Bloomfield's intention to use this strategy as an approach find the required credits through the market, find appropriate property for suitable offsetting sites or to pay into the Biodiversity Conservation Trust to achieve offsetting requirements.

3.3 Agricultural and Land Use

A detailed Agricultural Impact Statement (AIS) was prepared for the Project. The AIS formed Appendix O to the Project EIS. Following the identification of the New Disturbance area it was identified that that AIS that accompanied the EIS did not assess the full New Disturbance Area. Specifically an additional 41 hectare (ha) of land within the New Disturbance Area was identified of required additional assessment for agricultural impact. To address this, the same agricultural consultant undertook additional assessment of that 41ha area. A copy of the AIS for the 41ha area is attached at **Appendix D** and the results summarised below.

3.3.1 Soils and Land Capability

The 41ha Area has historically been used as a native pasture with a history of beef cattle grazing in the same way that other areas within the Project Area have historically been used. That is the raising of weaner cattle for sales through the Singleton Cattle Yards at the ages of 7 – 9 months.

The soils of the 41ha area were previously defined in the Soils and Land Impact Assessment (SLR, 2015) which formed Appendix P to the Project EIS. That report identified the 41ha area as containing a mix of the following soil types:

- Eutrophic Brown Chromosol, and
- Subnatric Brown Sodosol.

These soil types are identified as having moderate (Eutrophic Brown Chromosol) to low (Subnatric Brown Sodosol) fertility.

Based on the assessment undertaken by SLR (2015), the majority of the 41 ha area comprises Class 4 – Moderate capability land. This land has moderate to high limitations for high-impact land uses. These limitations restrict the potential for regular high-impact land uses such as cropping, high-intensity grazing and horticulture. These limitations require specialized management practices with a high level of knowledge, expertise, inputs, investment and technology.

A small component is Class 5 – Moderate-low capability land. This land has high limitations for high-impact land uses. Grazing can be conducted on this land at low stocking rates and low productivity levels. Other enterprise alternatives are limited and unlikely to be practical or viable with the additional management requirements of this land.

Land and Soil Capability

Appendix Q to the EIS contained the proposed Rehabilitation Strategy for the Project. Table 4 of the Rehabilitation Strategy included a comparison of the pre-mining and post-mining land and soil capability classes across the Project Area as correct at the time of completion of the EIS.

As a result of the changes to the Project since the exhibition of the EIS as detailed in **Section 2.0** the distribution post-mining land and soil classes have changed. In addition, the comparison provided in the Rehabilitation Strategy also assumed that mine infrastructure (including the CHPP, workshop, office/washhouse and related areas) would be maintained at the end of the Project to service a potential future underground operation that would be subject to a separate development approval. As a result these areas were excluded from the calculation provided in the EIS. Bloomfield has

subsequently committed to rehabilitating the entire Project Area, including existing mine infrastructure areas, at the completion of the Project. The updated comparison of pre-mining and post-mining land and soil capability classes is provided in **Table 3-6.**

Table 3-6 Comparison of Pre-Mining and Post-Mining Land and Soil Capability

Pre Mining			Post Mining							
			Disturbed Area			Undisturbed Area		Post Mining Total		
Class	Area (ha)	%	Slope	Class	Area (ha)	Class	Area (ha)	Class	Area (ha)	%
2	9.6	0.5	<10°	4	590.9	2	9.6	2	9.6	0.5
4	496.4	25	10°	4	394.7	4	206.8	4	1078.2	53.8
5	1096.2	55	10°-18°	5	147.2	5	436.1	5	681.7	34
6	402.4	20	>18°	6	1	6	137.6	6	154.4	7.7
			Inundated	N/A	80.7	Inundated	0	N/A	80.7	4
Total	**2004.6**				**1214.5**		**790.1**		**2004.6**	

3.3.2 Agricultural Production Impact

The Agricultural Impact Statement attached to the Project EIS assessed an area of 170ha of lost production and determined a loss of agricultural production of between:

- $30,072 per year based on 2014 cattle prices; or
- Up to $45,108 per year at the maximum improved production level with higher inputs, using the 2015 prices for beef cattle. This is a production level of $265 per hectare per year.

The additional 41 ha area is similar in agricultural capability to the entire 170 ha accessed for the EIS. The additional 41 ha would result in a production loss of an additional $10,879 per year. This would increase the total value of lost production as a result of the Project to $55,987 per year based on 2015 cattle prices.

In addition to calculations of production losses at 2015 prices as provided in the EIS, a review was also undertaken of the potential production losses at 2017 prices. This found that based on Meat and Livestock Australia's Eastern Young Cattle Index (EYCI) at 9 November 2017 of 526.75 c/kg, the total gross value of lost beef cattle production for the Project would be $75,313 based on 2017 cattle prices.

These price calculations are provided in **Appendix D.** When considering cattle prices it should be noted that there can be volatility throughout the years, and year on year, based on a number of factors including market and seasonal conditions.

3.3.3 Management Measures

The use of rehabilitation to return the final landform area to grazing productivity, where appropriate, would continue to be the primary management measure to minimise the impact to agricultural production. This is achieved through remediating land and returning land to pasture as soon as practical following the completion of mining. As a result of the Project a total area of 1,125ha would be returned to pasture following the completion of mining. This includes a total of 166.1ha of land that would be returned to pastures within the New Disturbance Area.

Rehabilitated land has been used for grazing since 2013 including an area of 67ha on the west pit out of pit emplacement area. Rehabilitation efforts have resulted in pastures which are demonstrating higher production capacities than the pre-existing native pastures. As discussed in **Appendix D** trials undertaken by the NSW DPI in association with the Upper Hunter Mining Dialogue, have demonstrated successfully the ability to return rehabilitated areas to grazing. It should be noted that the ability to return rehabilitated areas to grazing and minimise impact to agricultural production has not been factored into the revised prediction for loss of productivity. It is therefore considered that the revised prediction represents a worst case with actual impacts likely to be much lower.

A detailed description of the Project's proposed rehabilitation strategy is contained in Section 25.0 of the Project EIS and supported by the Rehabilitation Strategy which formed Appendix Q to the EIS. These documents provide a detailed description of Bloomfield's proposed approach to rehabilitation and returning rehabilitated areas to pasture where appropriate.

3.3.4 Conclusion

The additional 41 ha area not available for grazing would result in an additional agricultural productivity loss of around $10,879. However, the grazing undertaken on the 67 ha of rehabilitated land would more than compensate for this loss of agricultural grazing production on the 41 ha of native pasture.

3.4 Aboriginal Heritage

In order to confirm that the entire Project Area, has been subject to an appropriate level of assessment in regards to Aboriginal Heritage, a summary assessment report was prepared detailing those past Aboriginal assessments that have been undertaken at the Rix's Creek Mine. A copy of this report is attached at **Appendix C.**

The review indicates that previous Aboriginal heritage assessments have addressed the Project Area, and parts thereof since the early 1980's. Importantly more contemporary assessments by Effenberger (1994) and multiple assessments by AECOM (2014) have been undertaken and included archaeological survey. A record of these inspection areas is provided in Figure 1 of **Appendix C.**

As demonstrated in **Appendix C,** a significant level of assessment works has previously been undertaken for the Mine including at least four site surveys. Past survey efforts have been focussed on areas considered to be most archaeologically sensitive in order to maximise the effectiveness of survey efforts. The previous assessments have covered all areas considered to be archaeologically sensitive. It is therefore considered that there has been an appropriate level of archaeological investigation undertaken for the Project, New Disturbance Area.

The proposed Project disturbance area this has been assessed in the EIS. As detailed in **Section 6.7.1**, OEH has concurred with this assessment and recommended the preparation of an Aboriginal Cultural Heritage Management Plan to manage Aboriginal cultural heritage items and matters over the life of the Project.

4.0 Community Participation

The EIS was placed on public exhibition for 30 days from 3 November 2015 to 3 December 2015. During this time a range of consultation activities were undertaken to raise awareness of the public exhibition, to provide information about the EIS and to advise community members on how to make a formal submission. These additional activities are described in the following sections.

4.1 Static Display of the Environmental Impact Statement

The EIS and supporting material were available to view and download on the DP&E website (http://majorprojects.planning.nsw.gov.au/).

Hard copies of the development application and EIS were also provided at three display locations as follows:

- Department of Planning and Environment, 23-33 Bridge Street, Sydney;
- Singleton Shire Council, Administration Centre, Corner of Queen Street & civic Avenue, Singleton; and
- Nature Conservation Council, Level 2, 5 Wilson Street, Newtown.

4.2 Shopfront Display

During the exhibition period, the Mine established a shopfront in Shop 8 of the Singleton Town Square Shopping Centre, John Street Singleton. The Shopfront provided opportunity for any interested member of the community to access hardcopies of the EIS, view project plans and enter into discussions with key Mine staff to answer questions or express opinions regarding the Project. USB sticks containing the EIS documentation were also made available for community members to take home. The shopfront was open on the 10, 12, 16, 17and 24 of November from 3:00pm – 6:00pm. The Shopfront was staffed by two or more senior Mine representatives at all times.

4.3 Advertisements

Advertisements were placed in local newspapers to announce the public exhibition of the EIS and to invite feedback on the EIS as follows:

- Singleton Argus – 2 November 2015; and
- Newcastle Herald – 3 November 2015.

4.4 Community Newsletters

During the preparation and exhibition of the EIS, community newsletters were delivered to residences in Singleton and immediately around the Mine site. The following newsletters were issued:

- Newsletter No. 1 February 2014 – Issued to coincide with the initiation of the Project and submission of the Preliminary Environmental Assessment (PEA) for the Project;
- Newsletter No. 2 September 2014 – Issued during the preparation of the EIS to provide the community with an update on the progress of the environmental assessment for the Project and initial outcomes; and
- Newsletter No. 3 October 2015 – Issued to coincide with the public exhibition of the EIS to inform the community that the EIS would be on public exhibition and providing details on how the community can view the EIS and provide feedback.

4.5 Doorknocks to Nearby Residents

Prior to and during the exhibition of the EIS, senior Mine staff members undertook meetings with residents in the immediate vicinity of the Mine to inform them of the EIS exhibition period and offer hard and electronic copies for them to view.

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5.0 Summary of Submissions

5.1 Submissions Received

During the exhibition period, and for a short period thereafter, submissions in relation to the Project were accepted by DP&E. Submissions were provided to the Proponent for response. All submissions were reviewed and issues raised have been addressed in this RRTS Report.

A total of 140 submissions were received in response to the EIS, as summarised in **Table 5-1.**

Table 5-1 Summary of Submissions Received

Submission group type	Number of separate submitters*
State government agencies	8
Local councils	1
Interest groups / organisations	16 (6 supporting the Project, 10 objecting to the Project)
Individual public / community members	115 (79 supporting the Project, 36 objecting to the Project)
Total	**140**

* Note that submitter details were withheld at the request of some submitters. In the absence of being able to identify each submitter, these submission statistics may overestimate the number of different submitters.

Each submission has been individually examined with issues collated, and responses to the issues provided in **Section 6.0** and **Section 7.0** of this RRTS.

Submission authors have not been identified in this report (excluding agencies, councils and other key stakeholders). Submission authors have been assigned a unique identification number which is referred to in this report as a 'submission identification number'.

5.2 Matters Raised – State Government Agencies

Eight State government agencies made submissions, raising a range of issues relevant to their respective areas of interest and responsibility. A copy of the government agency submissions is provided at **Appendix E**. A high level summary of the comments provided and issues raised in each agency's submission is provided below, with a detailed response to specific issues provided in **Section 6.0**.

5.2.1 Department of Primary Industries

DPI Fisheries and DPI Lands raised no issues in relation to the Project.

DPI – Agriculture advised that it had no outstanding issues of concern and provided some general comments on the Agricultural Impact Statement prepared as part of the EIS.

DPI – NSW Office of Water raised issues relating to:

- Groundwater, including recommendations for improvement of the information and management measures as follows:
  - Independent review of the groundwater model; and
  - Additional information required to be included or addressed within the Water Management Plan, should the Project be approved.
- Water licensing, including:
  - Provision of a consolidated water licensing table, listing all water licenses and approvals and correcting some errors made in the licensing tables presented in the EIS;
  - Confirmation of the quantity of increased volume of water to be removed from alluvial and hard rock water sources as a result of the Project, and demonstration that sufficient licensed entitlement is held or can be obtained to account for the maximum predicted take; and

- Quantification of the loss of run-off as a result of the loss of catchment, and demonstration that the loss is accounted for via an appropriate Water Access Licence.

- Diversion of Stonequarry Gully, including:
  - Recommendation that an impact assessment of the proposed diversion of Stonequarry be undertaken in accordance with standard hydrologic and geomorphologic assessment and design standards, including assessment of impacts on water quality and quantity, dependent ecosystems, hydrology and geomorphology; and
  - Inclusion of proposed diversion design, and demonstration that the diversion is appropriately designed.

5.2.2 Division of Resources and Geoscience

The Division of Resources and Energy (DRE), now the Department Planning and Environment, Resources and Energy, Division of Resources and Geosciense (DRG) offered support for the Project as a responsible utilisation of the State's coal resources that would provide continued employment for around 150 personnel in a typical year of production and up to 225 personnel at full production, and bring economic benefits to the local region and the State as a whole. The following comments were also made with regard to specific areas of DRG's responsibility:

- Mining Title:
  - The Project has demonstrated sufficient title over the Project Area to satisfy the requirements of section 380AA of the *Mining Act 1992*; and
  - The mining lease includes requirements for submission of a Mining Operations Plan (MOP) prior to commencement of operations, and subsequent Annual Environmental Management Reports (AEMR).

- Rehabilitation:
  - It is noted that the EIS has identified general rehabilitation strategies and objectives and adequately describes the functional domains of the Project. Specific performance objectives and standards of each domain have been satisfactorily described; and
  - Final landform design must be consistent with the surrounding topography and the EIS has provided objectives and criteria which must implement.

- Assessment of the Resource:
  - DRG has verified that the Project provides approximately 46 million tonnes of ROM coal and approximately 25 million tonnes of product coal. The Proponent has completed the resource and reserve estimation for the Project in accordance with the Australasian Code for Reporting Exploration Results, Mineral Resources and Ore Reserves 2012 (the "JORC code");
  - DRG has examined the coal quality data of the seams to be mined from the Project and is of the opinion that the quality of the coal from the Project Area allows the two coal products (semi-soft coking product and a thermal product) to be sold on the export market;
  - Over the life of the Project the value of the coal produced would be worth around $3 billion in current dollars based on the expected split between export coking coal (60%) and export thermal coal (40%);
  - Export income is vital for the health of both the NSW and Australian Economy, contributing to the nation's balance of trade which provides positive benefits to both the NSW and Australian credit rating;
  - The Project is vital for the continuation of the existing Rix's Creek Mine, as without approval the current mine has a limited life that would see it close in the short term, given the low coal price environment, limited remaining coal resources and also overburden dumping issues that would be solved with Project approval;

- Given the pit design constraints, DRG considers the Project mine plan to adequately recover coal resources; and
- DRG has calculated that in a typical full production year, the State would receive around $9 million in royalty and $240 million over the life of the Project. The net present value of this royalty stream would be A$130 million using a 7% real discount rate.

- DRG recommended a number of conditions to be incorporated into the approval, relating to rehabilitation objectives and commitments, progressive rehabilitation, and preparation of a rehabilitation plan.

5.2.3 Dams Safety Committee

The Dams Safety Committee did not raise any issues with respect to prescribed dams or dam Notification Areas within the Project Area.

5.2.4 Environmental Protection Authority

The EPA raised issues relating to:

- The assessment of air quality impacts including:
  - Inclusion of estimated change to diesel engine particulate matter emissions, resultant impacts and specific measures to minimise emissions from this source;
  - Inclusion of assessment of potential impacts at all potentially affected properties in Maison Dieu, at Country Acres Caravan Park, and at Maitland Diesel Service;
  - Inclusion in the emissions inventory, estimates of dust emission from all bare areas; and
  - Request for additional information on the derivation of the emission rate of NO_2 from blasting.
- Discharge of water under the Hunter River Salinity Trading Scheme;
- The requirement for amendments to the current Environment Protection Licence (EPL) 3391; and
- Recommended conditions of approval.

5.2.5 Hunter New England Population Health

Hunter New England Population Health raised issues relating to:

- Air quality, including a recommendation that air quality modelling contours be provided using annual average PM_{10} goals of 20 µg/m^3 and 25 µg/m^3, as per the World Health Organisation (WHO) Air Quality Guidelines (2005) for particulate matter" and as proposed in the draft variation to the National Environment Protection (Ambient Air Quality) Measure (NEPM);
- Noise and blasting, including:
  - Recommendation that noise mitigation measures be implemented as soon as possible and strict controls be placed on operations during conditions that would lead to the noise levels predicted;
  - Recommendation that effective community consultation be undertaken to facilitate public involvement and to allow for the community to participate in the mitigation selection process; and
  - Recommendation for strict control of blast conditions to protect the public from blast fume emissions.
- Surface Water, including recommendation that private water users downstream have easy access to and can understand monitoring data and that, in the event that the water becomes unsuitable for use by private water users, that an alternative water source is offered;
- Rainwater tanks, including recommendation that the potential impacts on rainwater quality caused by dust from mining construction and operation be addressed, with consideration being given to the recommendations and standards contained within enHealth's *Guidance on use of rainwater tanks* (2010); and

- Recommendation that a management system be considered for taking complaints and rectifying issues identified.

5.2.6 Office of Environment and Heritage – Heritage Division

The Heritage Division recommended one condition of approval with respect to the "Linear Embankment and Mound with Historic Material", and stated support for the mitigation measures proposed in the EIS for the Rix's Creek Coke Ovens and Associated Works, recommending that these be adopted with a number of additions to the proposed updated Conservation Management Plan.

5.2.7 Office of Environment and Heritage

The OEH raised a range of issues relating to:

- Vegetation Mapping, including identification of potential error in the areas mapped as Central Hunter Valley eucalypt forest and woodland, which would impact on the Project's credit requirements;
- Aboriginal heritage, including recommendations for an Aboriginal Cultural Heritage Management Plan (ACHMP) for the Project; and
- Flood Assessment, including recommendation that a risk assessment be undertaken of the potential impact of the full range of flood events up to the Probable Maximum Flood, on the proposed water and sediment management dams.

5.2.8 Roads and Maritime Services

The RMS did not raise any concerns regarding the Project, and recommended a number of matters that should be addressed and included within the conditions of approval, including the requirement for a Traffic Management Plan, design requirements for the cut and cover tunnel, Side Track Road, and requirements for a Works Authorisation Deed.

5.3 Matters Raised – Singleton Council

A copy of the submission from Singleton Council is provided at **Appendix E.** Singleton Council stated that there were no significant issues of concerns, and made some general comments about the Project including:

- The Rix's Creek Mine Operations has not attracted any significant level of community concern and is regarded as being well managed;
- The mine design would allow for the future access to an underground resource post open cut operations, which would require separate approval at a future time;
- It is important that noise and air quality impacts described in the EA are comprehensively assessed by the technical experts in these areas to validate the modelling;
- While it is acknowledged that mining operations are moving away from Singleton, the extent of noise impacts on potential future residential areas in North Singleton (west of Bridgman Road and north of Gardner Circuit) is not clear;
- It is acknowledged that the Project currently has and would continue to have a visual impact on the New England Highway corridor; however the proposed progressive screen planting seeks to minimise impact in this regards. Also, the visual impact for two residences located on Maison Dieu Road would be mitigated by progressive screen planting along with rehabilitation;
- Significant ongoing discussion is taking place with the mining community regarding end use of mine sites and particularly final land forms and voids, therefore it is requested that any conditions are flexible in order to enable adaptive end of mine planning which is responsive to community and industry positions over time; and
- It is noted that the Project would deliver a net social and economic benefit to the Singleton Local Government area.

5.4 Matters Raised – Interest Groups/ Organisations

A copy of the submissions received from key stakeholders or special interest groups is provided at **Appendix F.** In total, 16 submissions were received from other key stakeholders or special interest groups within the community. Other key stakeholders that made submissions regarding the Project included:

- Two submissions from peak groups and advisory organisations:
  - Hunter Business Chamber; and
  - The Australia Institute.
- Seven submissions from environmental groups:
  - Nature Conservation Council;
  - DAMS HEG;
  - Doctors for the Environment;
  - Environmental Justice Australia;
  - Hunter Environment Lobby;
  - Ryde Hunters Hill flora Fauna Preservation Society; and
  - Singleton Shire Healthy Environment Group.
- Two submissions from community groups:
  - Hunter Communities Network
  - Correct Planning and Consultation for Mayfield Group; and
- Five submissions from local businesses and industrial companies:
  - PJ Welding;
  - Four Mile Engineering;
  - Kings Engineering;
  - WesTrac; and
  - Tolsaf Cranes.

Issues raised by these organisations / groups were generally similar to those raised by individual public submissions, and therefore these issues have been collated and considered together in **Section 7.0** along with a response to the issues raised. Where similar issues have been raised in different submissions, these have been combined and only one response provided. Care has been taken in this process to preserve the specific details of each issue raised.

5.5 Matters raised -Individual Public / Community Members

A copy of the submissions received from individual members of the community is provided at **Appendix F**. In total, 115 submissions were received from individual members of the community. Of these, a total of 79 submissions indicated support for the Project and 36 raised objections to the Project. The main issues raised by special interest groups and individual public submissions were as follows:

- Climate Change;
- Air Quality impacts, particularly relating to PM_{10};
- Noise impacts to local residents;
- Blasting management;
- Transport of coal (including rail congestion and covering of coal wagons);
- Biodiversity offset areas and impacts to biodiversity as a result of loss of habitat;
- Surface water impacts;
- Groundwater impacts;
- Final void; and
- Cumulative impact assessment.

A response to the issues raised in the community submissions is provided in **Section 7.0**. Where similar issues have been raised in different submissions, these have been combined and only one response provided. Care has been taken in this process to preserve the specific details of each issue raised.

6.0 Response to Government Agency Submissions

6.1 Department of Primary Industries

DPI Agriculture advised that there were no outstanding issues of concern and made a number of comments regarding the Agricultural Impact Statement.

DPI – NSW Office of Water made a number of recommendations and provided detailed comments as part of Attachment A of the submission.

6.1.1 Agricultural Impact Statement

Issue Description

Although the Agricultural Impact Statement claims that the reinstalment of this disturbed area is of the same land and soil capability, it is noted that more rehabilitated land would be allocated to Class 5 land rather than Class 4. Whilst there would be a reduction in land of higher quality, the mine rehabilitation work should result in greater agricultural productivity provided the Company complies with its stated methodology and applies its research findings. Bloomfield is actively engaged in rehabilitation programs including work with the Australian Coal Association Research Program (ACARP) using biosolids on rehabilitated land. Bloomfield has rehabilitated 375 ha of land. The results of the grazing trial on rehabilitated land involving NSW DPI at other mine sites has shown to increase beef production also which supports the approach at this Mine.

Hence the attention to the rehabilitation of land to agriculture as described in the Agricultural Impact Statement should mitigate agricultural production impacts.

Response

This is noted.

6.1.2 Groundwater

A detailed response to each of the groundwater related issues raised in the DPI submission was prepared by RPS Water. The response is provided in full at **Appendix G** of this RRTS Report, with a brief summary presented here.

Issue Description

The broad impacts of the Project are likely to be within acceptable bounds given the location in this brownfield mining area, however the information and management measures should be improved to allow for proper understanding and management of the impacts of the Project.

- As required under the Aquifer Interference Policy (AIP), an independent review of the groundwater model is required to ascertain in the expert's opinion if the groundwater model is:
  - Calibrated against suitable baseline data, and in the case of a reliable water source, over at least two years;
  - Consistent with the Australian Modelling Guidelines; and
  - Independently reviewed, robust and reliable, and deemed fit for purpose.

Response

As required by the NSW Aquifer Interference Policy, an independent review of the groundwater model has been undertaken by Peter Dundon, of Dundon Consulting Pty Ltd. A copy of the report is attached at Appendix D of the RPS Water response (included in **Appendix G**). The review concluded that the groundwater assessment has been undertaken in accordance with the requirements of the NSW Aquifer Interference Policy.

Issue Description

A number of data and information gaps are noted in attachment A, and these are requested to be addressed prior to preparation of the Water Management Plan. This information should be provided within (or attached to) the Water Management Plan.

Response

In response to issues raised in the DPI submission, DPI Water representatives attended a meeting at the Mine on 21 January 2016 to undertake a site tour for familiarisation, with subsequent discussion of the specific issues raised.

A register of DPI Water issues, including a summary of the requirements and outcomes following the site meeting, is provided in full at Appendix A of the RPS Water response (**Appendix G** of this RRTS).

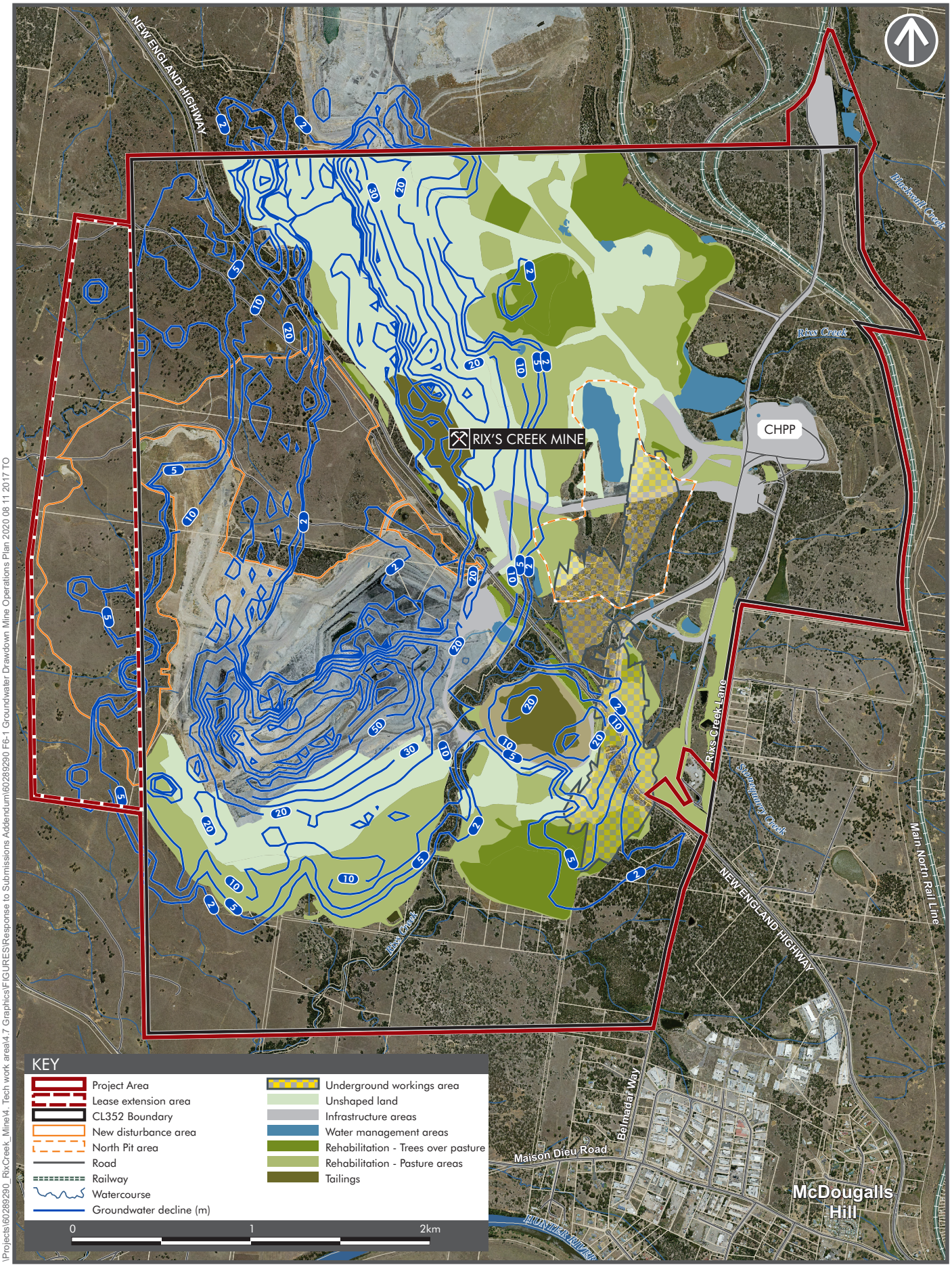
General issues raised by DPI related to uncertainty about how the groundwater is hydraulically connected between the various pits and underground workings; request for additional detail; or clarification of information presented in the EIS. A number of these issues were clarified during the site meeting with DPI. Supplementary groundwater information is provided in the RPS Water response to address the remaining general issues (refer to Section 3 and Appendix A of the RPS Water response provided at **Appendix G** of this RRTS).

A number of issues raised related specifically to the groundwater modelling undertaken. Several of these issues resulted from the fact that modelling figures presented in the EIS were not legible, and this was a result of PDF files being subject to file size reduction. A set of revised figures pertaining to the original groundwater modelling is provided as Appendix E of the RPS Water response at **Appendix G**. In particular DPI Water noted the need for updated drawdown figures. These are shown in **Figures 6-1** to **Figure 6-6**.

Other modelling issues related to the conceptual hydrogeological model, calibration of the model, the presence of a general head boundary, and independent review of the model. Again, many of the modelling issues were clarified during the site meeting with DPI, and supplementary groundwater information is provided in the RPS Water response to address the remaining modelling issues (refer to Section 4 and Appendix A of the RPS Water response provided at **Appendix G** of this RRTS).

DPI also queried the off-site impacts, including inflows to Integra mine and impacts to Integra Mine South Pit and Western Extension, and to Ashton Coal Underground Mine. These issues are discussed in Appendix A of the RPS Water response, with additional information shown on schematic diagrams and sections.

DPI made some recommendations for addressing the groundwater issues, with specific regard to the NSW Aquifer Interference Policy minimal impact considerations, aquifer conceptualisation, the location of monitoring bores and the groundwater model. These recommendations have been addressed, and details discussion is provided in Appendix A of the RPS Water response at **Appendix G** of this RRTS**.**



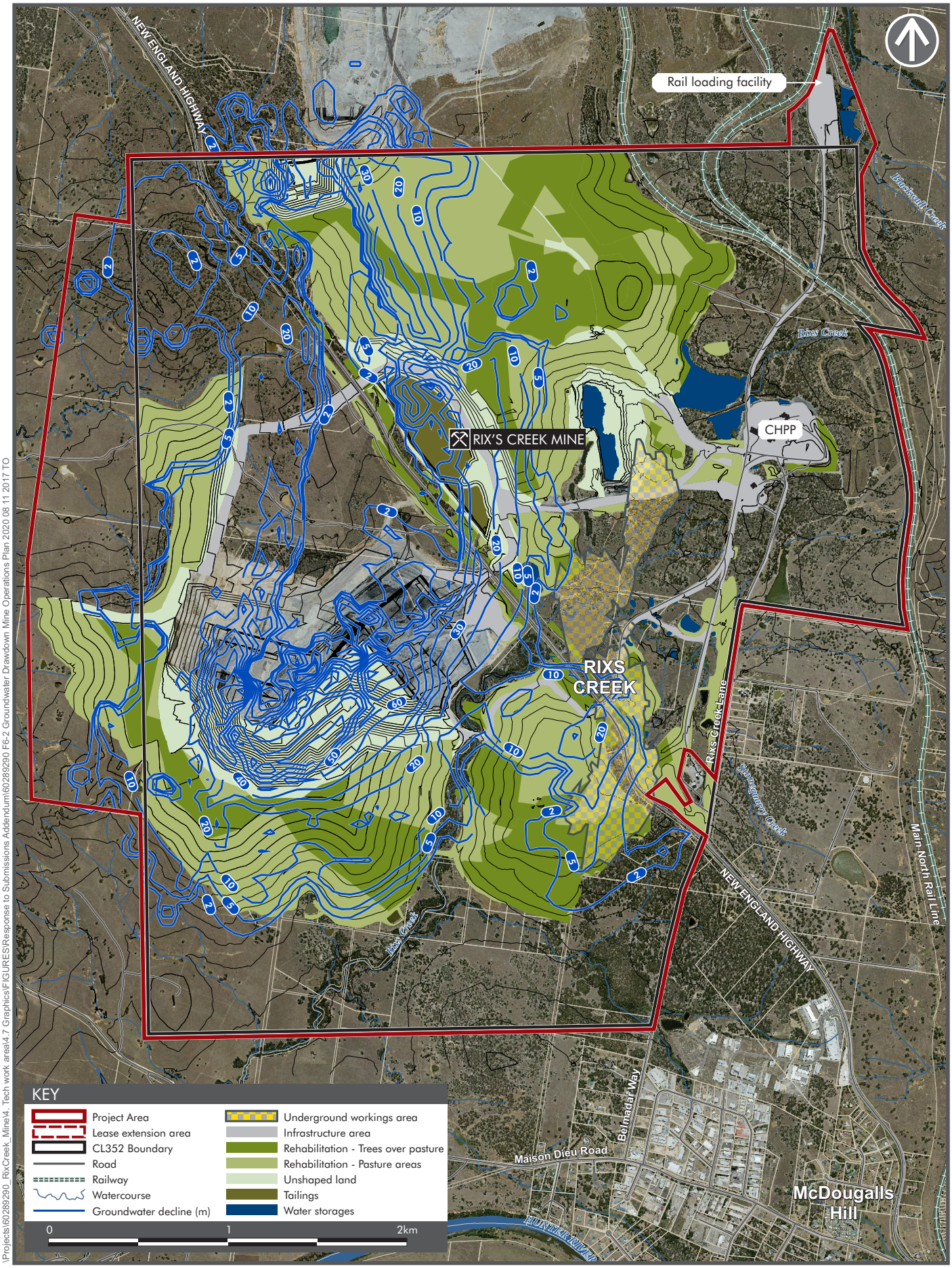
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AECOM

GROUNDWATER DRAWDOWN - MINE OPERATIONS PLAN YEAR 2017

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 6-1



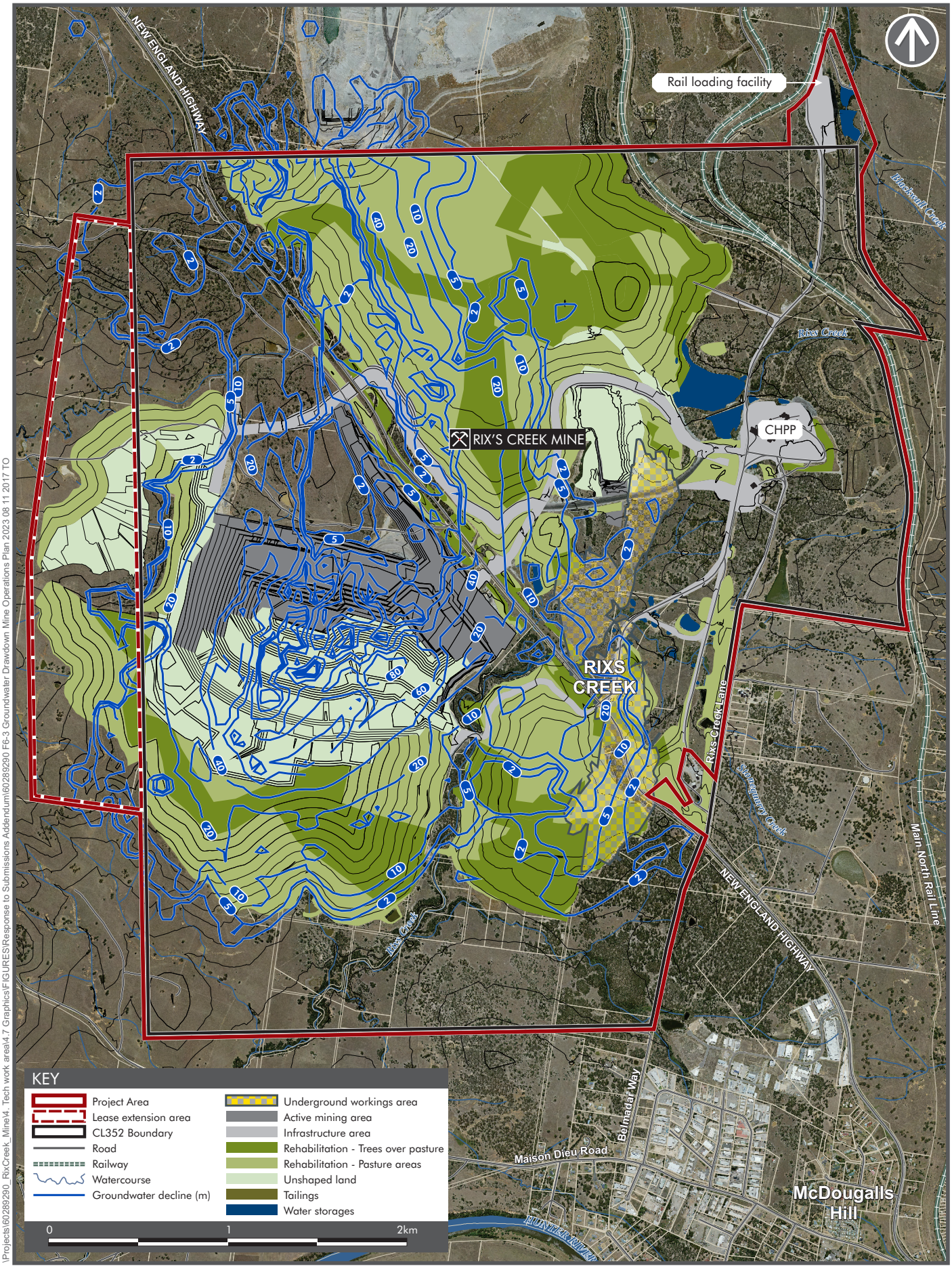
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AECOM

GROUNDWATER DRAWDOWN - MINE OPERATIONS PLAN YEAR 2020

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 6-2



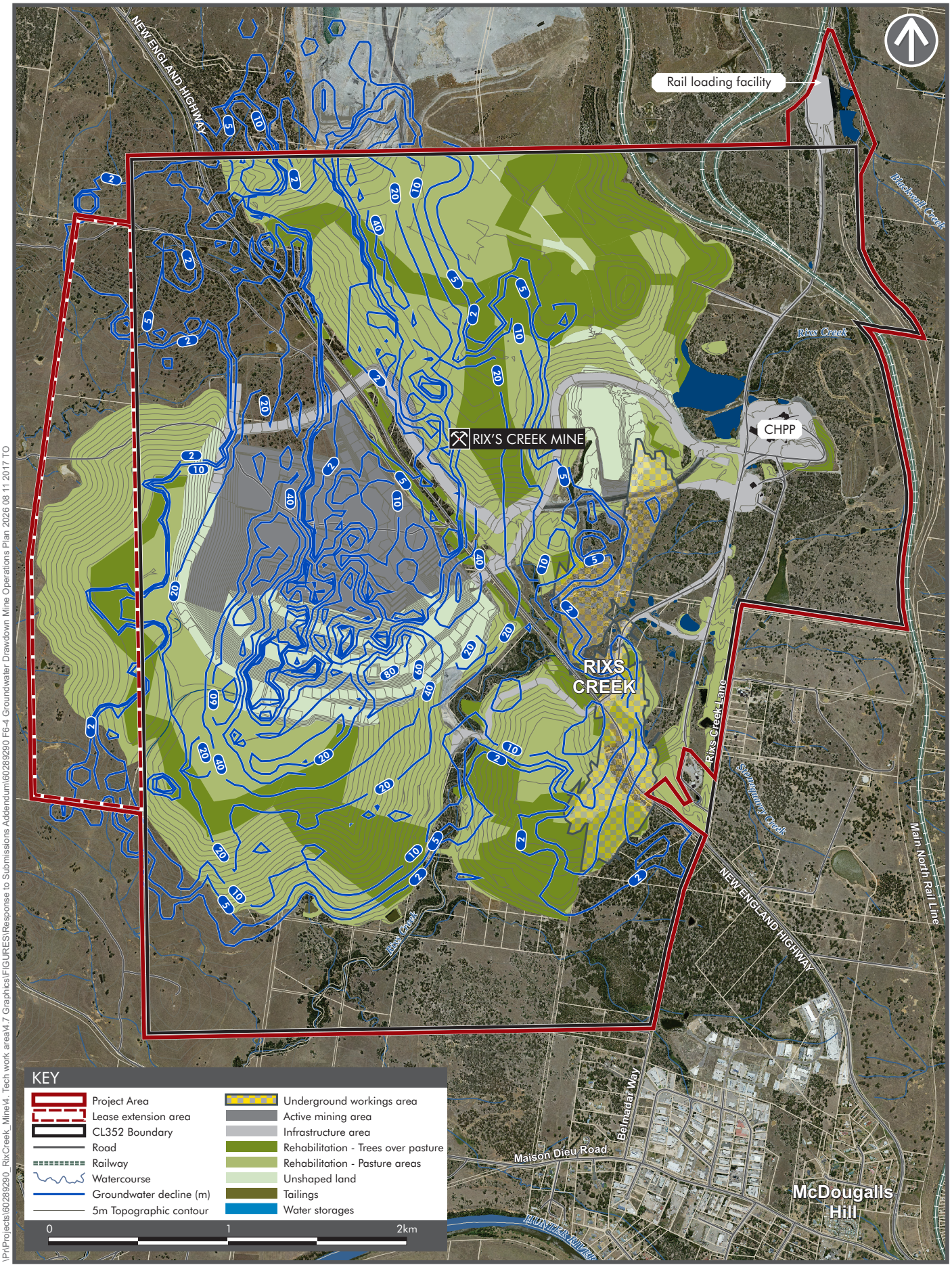
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AECOM

GROUNDWATER DRAWDOWN - MINE OPERATIONS PLAN YEAR 2023

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 6-3



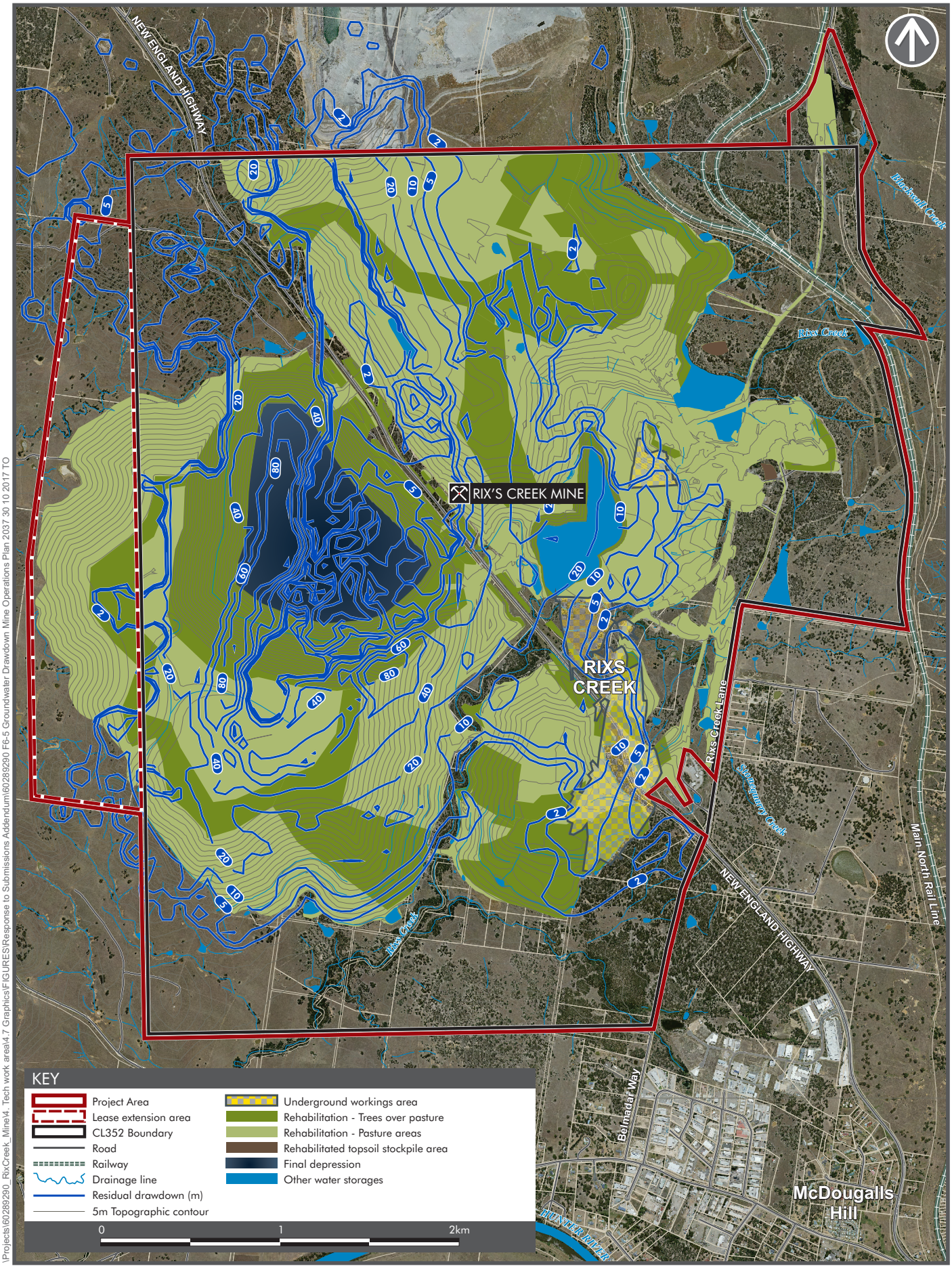
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AECOM

GROUNDWATER DRAWDOWN - MINE OPERATIONS PLAN YEAR 2026

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 6-4



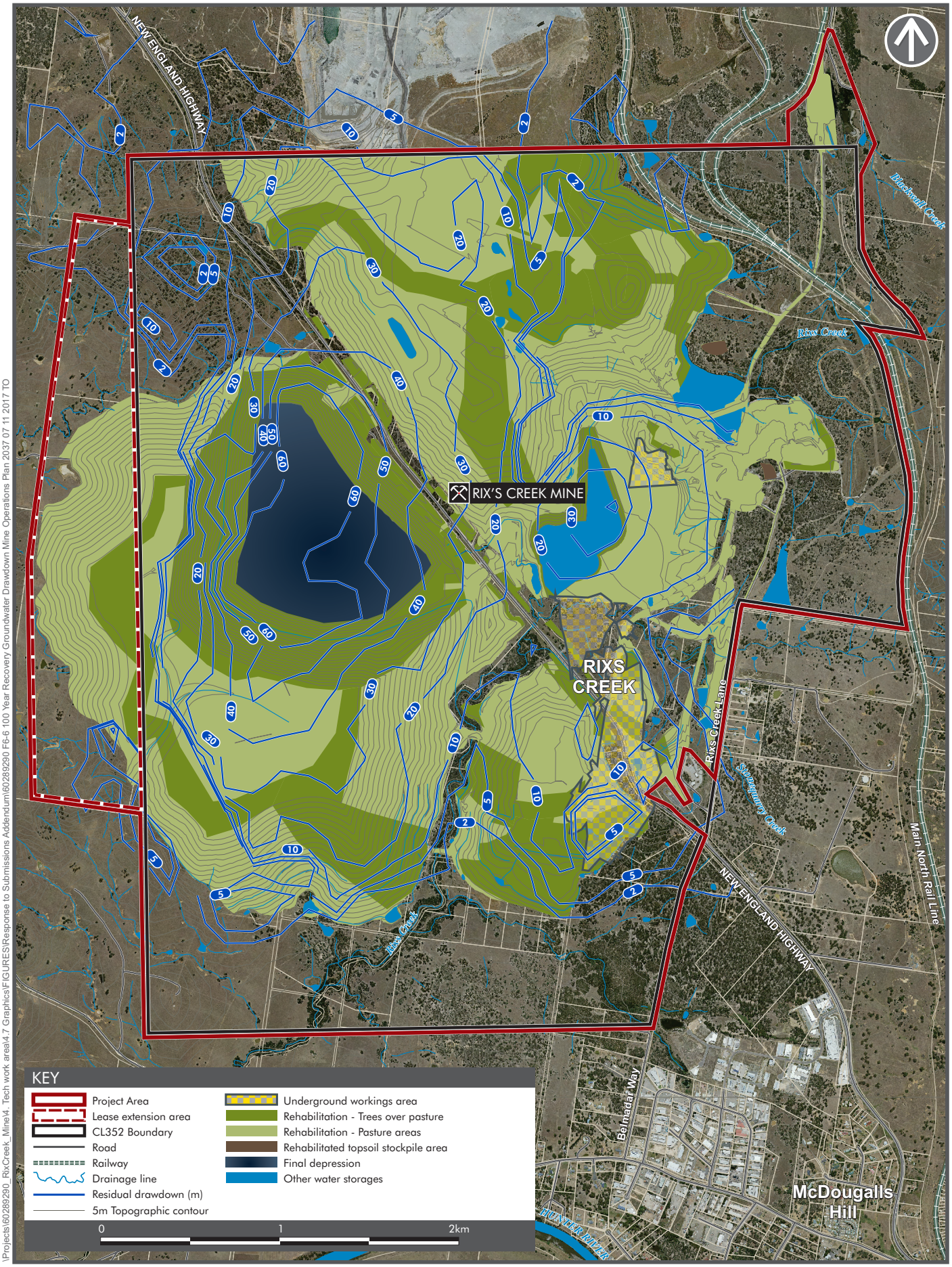
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AECOM

GROUNDWATER DRAWDOWN - MINE OPERATIONS PLAN YEAR 2037

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 6-5



\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions Addendum\60289290 F6-6 100 Year Recovery Groundwater Drawdown Mine Operations Plan 2037 07 11 2017 TO

AECOM

100 YEAR RECOVERY CONTOURS - MINE OPERATIONS PLAN YEAR 2137

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 6-6

6.1.3 Water Licensing

Issue Description

The proponent must provide a consolidated water licensing table, listing all water licenses and approvals under the *Water Act 1912* and the *Water Management Act 2000* (WMA) for both surface and groundwater (hard rock and alluvial) related to the site. Table 15-4 in the EIS could be expanded to achieve this. The consolidated license table should correct errors in the licensing tables presented in the EIS.

The proponent must confirm the quantity of the increased volume of water to be taken from both the alluvial and hard rock water sources as a result of the proposed expansion, and demonstrate that sufficient licensed entitlement is held or can be obtained to account for the maximum predicted take. The proponent would need to apply and obtain an increase in entitlement from the porous rock aquifer to address the peak predicted take of groundwater from this water source.

The proponent must quantify the loss of run-off as a result of the loss of catchment detailed in Table 15-3 and must demonstrate that the loss is accounted for via an appropriate Water Access Licence.

Response

A consolidated water licensing table has been prepared as requested, including all surface and groundwater licenses and approvals (refer **Table 6-1**).

With regard to the increased volume of water taken from alluvial and hard rock water sources, Table 16-7 of the EIS provides the estimated licensing requirement over the life of the Project. The peak modelled groundwater inflow was predicted to occur in 2020-2021, with a total modelled inflow of 305 ML/a. The predicted annual inflow diminishes to 126 ML/a during the final full water licensing year. Given that the mine schedule has been amended as a result of the Integra Mine purchase (as discussed in **Section 2.0**), this represents a conservative estimate and the actual groundwater inflow experienced is likely to be lower. The licenced entitlement for hard rock groundwater currently held by the Mine is 100 ML/a, based on the current yearly Sample Static Water Balance is sufficient until the end of 2019. The Proponent has submitted an application for additional Groundwater Licence allocation to NSW Office of Water (dated 10 August 2015). The application is for an additional 205 ML on licence 20BL170863, increasing the total allocation on this licence to 305 ML. This would ensure that sufficient entitlement is held for the maximum predicted groundwater take.

It is noted that DPI Water has imposed an Embargo Order for the Hunter Water Shortage Zone, under Section 113A of the *Water Act 1912.* The Order places an embargo on any further applications for licences within the Water Shortage Zone, and took effect on 5 February 2016. For coal mines within the Water Shortage Zone, this means that new groundwater licences would not be issued to meet water demands, but operators would be required to trade with other water licence holders. The Rix's Creek Mine is located within the Water Shortage Zone. However, the Embargo Order only applies to applications lodged after the Order came into effect. DPI Water has confirmed that because the Mines' application for additional groundwater licence allocation on licence 20BL170863 was submitted prior to the embargo taking effect, the application can be assessed in accordance with the rules that applied at the time the application was lodged. This application is currently being processed (lodged 10 August 2015) and is expected to be granted following approved of SSD_6300.

With regard to loss of run-off as a result of loss of catchment, the surface water study, Appendix R of the EIS, Section 6.2.2 page 117 states:

"In summary, there will be a net loss of 243 ha from the three catchments directly affected by this project. The loss of average annual runoff from reduced catchments is estimated at 75ML p.a. using average annual rainfall at Jerrys Plains of 645 mm and a volumetric runoff coefficient of 0.08 (See Table 28 in Appendix A)."

As this application does not include the future portal area for the underground resource, the net maximum loss of catchment is now 140ha. Based on the above rainfall and runoff coefficient and the revised catchment loss of 140ha, the revised Project would result in the loss of approximately 45ML average annual runoff, not the 75ML previously reported.

Water Access Licences 17992, 19024, 19027 and 19035 (totalling 541 share units of the Hunter Unregulated and Alluvial Water Sources – Singleton) are available to account for this loss.

6.1.4 Diversion of Stonequarry Gully

Issue Description

Insufficient information has been provided to allow DPI Water to assess the impacts of the proposed diversion of Stonequarry Gully. The following recommendations are made in relation to the proposed diversion:

- The proponent must undertake an impact assessment of the proposed diversion of Stonequarry Gully. This must include assessment of impacts on water quality and quantity, dependent ecosystems, hydrology and geomorphology;
- The proponent must provide proposed diversion design, and must demonstrate that the diversion is appropriately designed to mimic natural hydraulic, hydrologic, geomorphic and ecological functions of the water course; and
- The above assessment should be conducted in accordance with standard hydrologic and geomorphologic assessment and design standards, including Rutherfurd I. D., Jerie K., Marsh N. (2000) A Rehabilitation Manual for Australian Streams. Cooperative Centre for Catchment Hydrology. Land and Water resources Research and Development Corporation Canberra.

Response

This issue is discussed in **Section 2.3** of this RRTS Report. The proposed stream diversion would not be required until approximately 18 to 20 years into the Project. During that time mine schedules and plans may change sufficiently to render any approvals gained now obsolete. Bloomfield has therefore decided to exclude the stream diversion from the current Project and approval is no longer being sought for these works. Should the stream diversion be required in the future, Bloomfield would carry out the necessary studies to gain approval via a development consent modification, or a separate approval process under the *Water Management Act 2000*.

Table 6-1 Consolidated Water Licensing Table

Licence / Approval number				Works	Use	Water Source	Category	Share component / Maximum annual yield or extraction limit
Water Access Licence (WAL)	Works Approval	Usage Approval	Bore Licence					
11919	20WA201037	20UA201038 20UA201039 20UA201040	-	Diversion works - pumps	Irrigation	Hunter Regulated River	General	159
11918	20WA201037	20UA201038 20UA201039 20UA201040	-	Diversion works - pumps	Irrigation	Hunter Regulated River	General	49.5
11917	20WA201037	20UA201038 20UA201039 20UA201040	-	Diversion works - pumps	Irrigation	Hunter Regulated River	General	49.5
9912	20WA201037	20UA201038 20UA201039 20UA201040	-	Diversion works - pumps	Irrigation	Hunter Regulated River	General	24
19024	20WA209900	-	-	Diversion works – pumps / storages	Water Supply Works	Singleton	Unregulated River	150
17992	20WA207389 20WA207390	-	-	Diversion works – pumps / storages	Water Supply Works	Glennies	Unregulated River	5
19027	20WA209902	-	-	Diversion works – pumps / storages	Water Supply Works	Singleton	Unregulated River	300
19035	20CA209920	-	-	Diversion works – pumps / storages	Irrigation	Singleton	Unregulated River	91
11084	20WA201499	-	-	Diversion works - pumps	Water Supply Works	Hunter Regulated River	General	1
-	-	-	20BL170863	Bore	Dust Suppression	Hard rock	-	100
-	-	-	20BL170864	Bore	Dewatering (groundwater)	Singleton	-	100
-	-	-	20BL168734	Test bore	Monitoring Bore	N/A	-	-

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6.2 Division of Resources and Energy

6.2.1 Mining Title

Issue Description

The proponent has demonstrated that the proposal has sufficient title over the Project area to satisfy the requirements of section 380AA of the *Mining Act 1992*.

Under the *Mining Act 1992*, mining and rehabilitation are regulated by conditions included in the mining lease, including requirements for the submission of a Mining Operations Plan (MOP) prior to the commencement of operations, and subsequent Annual Environmental Management reports (AEMR).

Response

The *Rix's Creek Mine Mining Operations Plan (March 2013)* is the current MOP for the Mine. Bloomfield submitted a new MOP to incorporate the proposed Project following development consent. Bloomfield currently prepares an AEMR each year to report on the mining operations, environmental management and rehabilitation activities undertaken throughout the year. Bloomfield would continue to prepare and submit an AEMR to report on the progress of the proposed Project should it be approved.

6.2.2 Rehabilitation

Issue Description

DRG notes that the EIS has identified general rehabilitation strategies and objectives and adequately described the functional domains of the Project. Specific performance objectives and standards of each domain have been satisfactorily described.

DRG requires final landform design to be consistent with the surrounding topography and the EIS has provided objectives and criteria to which would be implemented to achieve this.

Response

This is noted. As per the commitment made in Ref# 25.6.1 of the Management and Mitigation Measures provided in Table 29-1 of the EIS, "*the proposed final landform will be consistent with the surrounding natural landscape*". The mined lands are to be rehabilitated back to pasture and areas of trees over grass. The focus on the earthworks and rehabilitation program is to provide stable landforms, compatible with the surrounding landscape that would allow optimal post mining land use in terms of current social and economic constraints.

The proposed final landform at the Mine would address all development existing at the time of determination and proposed further development:

- Provide a post mining landscape which would be safe and non-polluting, with a stable drainage network;
- Not impact the area of Land and Soil Capability Class 2 lands;
- Provide slopes of less than or equal to 10 degrees (18% slopes) (Land and Soil Capability Class 4) over the majority (53.8%) of the site;
- Provide slopes between 10-18 degrees (Land and Soil Capability Class 5) over 34% of the site;
- Have 80.7ha of land below water in the final void; and
- Limit areas of greater than 18° (33%) slopes to 7.7% of the Project Area i.e. the batters of the tunnels under the highway and sections of the batters of the final void (Land and Soil Capability Class 6), prior to the void filling with water.

The rehabilitation goals and objectives for the Project are set out in the Rehabilitation Strategy, which guides the rehabilitation program across the entire Mine site.

6.2.3 Assessment of the Resource

Issue Description

The DRG submission contained a range of comments in relation to:

- Size and quality of the resource – Confirmed the quantity of coal resource available in the Mine lease area, its suitability for use in thermal and coking applications;
- Resource recovery – DRG confirmed that based on the information contained in the EIS it considers the Mine plan has been adequately prepared to recover the available resource;
- Coal Royalty – DRG calculated that the Project would result in approximately A$9 million in royalty payments per year as a result of the Project and approximately A$240 million in royalty payments over the life of the Project; and
- Other factors – DRG noted that based on the economic assessment prepared for the Project that it would:
    - Contribute A$394 million to NSW in Gross State Product;
    - Contribute A$104 million to regional Gross Regional Product;
    - Generate a net economic benefit of around A$250 million;
    - Spend a total of around A$110 million in capital expenditure over its life; and
    - Would employ around 150 personnel in a typical year of production and up to 225 personnel at full production.

Response

DRGs recognition of the economic benefits of the Project are noted.

6.2.4 Recommended Conditions of Approval

Issue Description

DRG recommended a number of conditions to be incorporated into the conditions of approval for the Project, if granted. These related to rehabilitation objectives and the Rehabilitation Plan to be prepared for the Project.

Response

The Project would be undertaken in accordance with the conditions imposed on the development consent and it is expected that these would take account of DRG's recommended conditions.

6.3 Dam Safety Committee

Issue Description

The proposed development area does not impact any prescribed dams or dam Notification Areas, also there are no newly proposed dams within the proposal that are likely to be considered for prescription. The Dam Safety Committee has no concerns therefore with the development application proposed and has no further comments for submission.

Response

This is noted.

6.4 Environmental Protection Agency

The EPA made a number of comments, including recommended conditions of approval in Attachment 1 of its submission, and detailed comments regarding air quality in Attachment 2 of the submission.

A detailed response to the air quality issues raised by the EPA was prepared by the air quality consultant Todoroski Air Sciences. A full copy of Todoroski Air Sciences response to the EPAs comments is provided **Appendix H** and detailed below.

6.4.1 Diesel Emissions

Issue Description

The estimation of emissions from diesel engines has been done explicitly to assess contribution to potential impacts on nitrogen dioxide (NO_2) concentrations, as shown in Section 10 of the Air Quality Impact Assessment (AQIA) (Appendix L of the EIS). Emissions of particulate matter have been included in the estimation of emissions from the movement of materials (Table 5-1 of the AQIA).

Section 5.1.1 of the AQIA states the estimated dust emissions "reflect the application of best practice dust mitigation currently being implemented at the site". This includes use of water suppression to reduce dust emissions, listed as providing 85% control for hauling on unsealed roads. Water suppression is not applied to emission from diesel engines.

This approach leads to underestimation of emissions of particulate matter from diesel engines. As noted in Section 10 of the AQIA, there are substantial quantities of diesel used by the proposed operations, which in the EPA's experience can contribute to a significant proportion of total $PM_{2.5}$ emissions from mine sites.

Based on the above, emissions of particulate matter from diesel engines have not been adequately estimated, and the assessment does not appear to nominate controls for particulate emissions from diesel engines. The EPA requires the Proponent determine and report the change to total emissions and resultant impacts, and specify measures to minimise emissions from this source.

Response

The US EPA AP4-2 emissions factor equations used in the AQIA for hauling activities include contributions from diesel exhaust emissions. The emission factor equations do not distinguish between separate sources of emissions from haul trucks as all of the emissions were measured when deriving the equations. Direct measurements by Todoroski Air Sciences, which included exhaust and wheel generated particulate, showed that watering was able to reduce total emissions by more than 85%. Whilst it would be correct that watering only controls wheel generated dust, it does not follow that this underestimates the total emissions, as assumed by the EPA.

In its letter, the EPA states that diesel exhaust particulate may not have been adequately estimated due to the use of the 85% control factor (that is dust suppression, typically through the use of water carts, is constantly applied to 85% of the trafficked area) for haul road emissions, and requires this to be quantified. To address the EPA requirement, some further hypothetical calculations were made, as outlined below.

To determine the level of impact of the haul truck diesel exhaust emissions, the potential diesel exhaust emissions were estimated separately and compared with the modelled emissions presented in the AQIA. The worst-case, Year 2023 emission estimates are used to address the EPA request.

To estimate potential particulate matter (PM) emissions from the diesel powered equipment, the emission factor set out in the US EPA Federal Tier II standards of emissions for diesel equipment was applied for the number of haul road vehicles obtained from Table D-3 in Appendix D of the AQIA, and assuming a load factor and average operational hours as those assumed in the NSW EPA Emissions Inventory (NSW EPA, 2012).

This resulted in an estimated amount of approximately 18,108 kg/year of total PM emissions from haul road vehicle exhaust in Year 2023.

$PM_{2.5}$ emissions from hauling (the use of haul trucks to move overburden and ROM coal) operations are estimated to be:

- 43,455 kg/year when applying an 85% control factor as per the US EPA emission factor equations (i.e. as modelled); or
- 58,847 kg/year when applying an 85% control factor only to the emissions due to mechanical processes.

The difference of approximately 15,392 kg/year is calculated to represent the potentially underestimated emissions. A summary of changes related to vehicle exhaust to meet the EPA request to show further details, is outlined in **Table 6-2**.

Table 6-2 Summary of changes related to vehicle exhaust as requested by EPA

Parameter	TSP	PM_{10}	$PM_{2.5}$
Mass of emissions at mine			
Total emissions for Year 2023 (kg)	2,951,166	1,153,296	138,112
Hypothetically underestimated haul road vehicle exhaust PM emissions (kg)	15,392	15,392	15,392
Percentage of Total emissions (%)	0.5 %	1.3%	11.1%
Concentrations of emissions from mine at most impacted private receptors			
Maximum predicted annual average result at private receptor (µg/m³)	17	10	1
Potential change in predicted annual average result due to additional vehicle exhaust PM emissions (µg/m³)	0.09	0.13	0.11
Percentage of criteria of potential change in predicted annual average result (%)	0.1%	0.4%	1.4%

The effect on estimated total emissions from the Mine is approximately 0.5% for TSP and 1.3% for PM_{10}.

The effect of this potential change in emissions would be a potential change in the maximum predicted concentrations at the most affected private receptors of 0.09µg/m^3 for TSP and 0.13µg/m^3 for PM_{10}, which is small and well within the accuracy of the modelling. Overall this indicates that even if there were any potential underestimation of emissions due to haul road vehicle exhaust, this would be negligible and would not affect the conclusions of the AQIA.

It should also be noted that no new equipment is now proposed for the Project and it would operate with the existing equipment at the site. It should be noted however that modifications to the existing Mine approvals allow for coal from the Mine to be washed at the Integra Mine CHPP and vice versa. Due to the purchase of the Integra Mine by the Rix's Creek Mine, it is proposed that a scaling back of existing and proposed operations would occur, particularly during the peak production year of 2023. Thus predicted impacts would be lower than presented in the AQIA and shown in the above table.

Control measures that would be used to ensure emissions from diesel engines are minimised where possible include the following measures that would be applied for the Project:

- Where possible, the excess use of vehicles and plant should be minimised by scheduling operations to maximise efficiency (e.g. using plant at or near to its capacity to minimise the amount of time utilised);
- When not in use, engines of on-site vehicles and plant would be switched off;
- Any new plant or vehicles purchased would have adequate pollution reduction devices fitted;
- Vehicles and plant would be maintained and serviced according to manufacturer's specifications; and
- Fleet optimisation would be applied to reduce vehicle kilometres travelled.

6.4.2 Potentially Affected Properties

Issue Description

The assessment predicts exceedances of the air quality criteria as summarised in the tables provided in Section 9 of the AQIA. Impacts above criteria were found for fifteen receptors not owned by the mine. Nine of these are assessed as having impacts from the Mine greater than air quality criteria, while the other six are assessed by the cumulative assessment to experience additional exceedances of the 24-hour criterion for PM_{10}.

The Executive Summary comments that of the nine directly impacted receptors, one has an existing negotiated agreement (including mitigation measures) with the Project while the other eight are included in the acquisition zone of other existing approved projects.

The cumulative assessment finding that six non-mine receptors are expected to experience additional days above the 24-hour PM_{10} criterion should be included in the summary in Section 16 and the Executive Summary of the AQIA.

Response

This is noted. Given the proposed amendments to the mining schedule as detailed in **Section 2.0**, the proposed reduction in peak year production as originally proposed in the EIS has been scaled back. The total movement of material is proposed to be reduced by approximately 25% during the peak mining period which would lead to a reduction in total dust emissions of approximately 18%. A detailed assessment of the effects of this reduction on all sensitive receivers is provided in **Appendix H.**

Issue Description

The EPA previously queried whether the receptors used in the assessment adequately represented Maison Dieu. In the letter dated 15th October 2015, Todoroski Air Sciences, as consultants for the Proponent, respond that there are a number of receptors closer to the active mine and near this estate, providing a conservative estimate at this receptor.

Maison Dieu lies behind an arc from receptor R140 and M18. In this sense R140 is closer to the Project. However, both R140 and M18 are assessed as exceeding air quality criteria. It is therefore possible that other receptors in the area could also exceed, especially given the prevalence of wind from the west-north-west. The EPA requires assessment of additional receptors in this area to identify all potentially affected properties.

Country Acres Caravan Park at 58 Maison Dieu Road lies to the south-west of the proposed pit expansion and within 500 metres. It does not appear to have been assessed as a receptor. Maitland Diesel Service is located on Rix's Creek Lane and also does not appear to have been assessed as a receptor. The EPA requires the potential impacts at these receptors to be assessed.

Response

As requested by the EPA, a further detailed assessment of the additional receptors in the area of Maison Dieu has been conducted. The analysis examines the Country Acres Caravan Park located at 58 Maison Dieu Road, (assessed in the AQIA as privately-owned Receptor 45) and Maitland Diesel Services which is 50% owned by the Mine (assessed in the AQIA as a mine-owned receptor, Receptor M20).

Maitland Diesel Services is a diesel engine repair operation with a primary purpose to service and maintain diesel equipment. Maitland Diesel Service is 50% owned by The Bloomfield Group. This receptor is considered to be associated with the Rix's Creek Mine (as it would not exist without the mine), and hence no further analysis is performed on this receptor. The predicted air quality impacts at this receptor (M20) are presented in Section 9 of the AQIA.

A contemporaneous PM_{10} assessment per the NSW EPA Approved Methods has been performed for the Country Acres Caravan Park (Receptor 45) to determine the extent of potential impacts at this location. A summary of the findings of the contemporaneous assessment is presented in **Table 6-3.**Time series plots of the 24-hour average PM_{10} concentrations are presented in **Figure 6-7** and **Figure 6-8**.

Table 6-3 NSW EPA contemporaneous assessment – maximum number of additional days above criteria

Receptor ID	2017	2020	2023	2026
45 (Country Acres Caravan Park)	0	1	4	3

The results indicate that the potential cumulative PM_{10} impact which could arise at this location may be between one to four additional days of impact. A comparison of these predictions with those predicted for Receptor 140 and Receptor 61, which are located closer to the Project than the Country Acres Caravan Park, show that the predicted number of days where exceedances may occur would likely be lower in some years, indicating that the predicted levels for the surrounding area would be of similar magnitude.

It is noted that with the recent purchase of the Integra Mine, Bloomfield is proposing to reduce the modelled mine schedule/ activity during Year 2023. This would reduce the level of dust emissions hence the predicted impacts in the worst case year 2023 would be less than shown above and in the EIS.

The time-series plots presented in **Figure 6-7** and **Figure 6-8** indicate that **Table 6-3** is not a good indicator of potential impact. The plots are included to show how a general decline in overall impacts occurs over time (noting that Year 2023 is modelled at higher activity rates than are now proposed to occur).



Figure 6-7 Predicted 24-hour average PM_{10} concentrations for Receptor 45 in Year 2017 and 2020

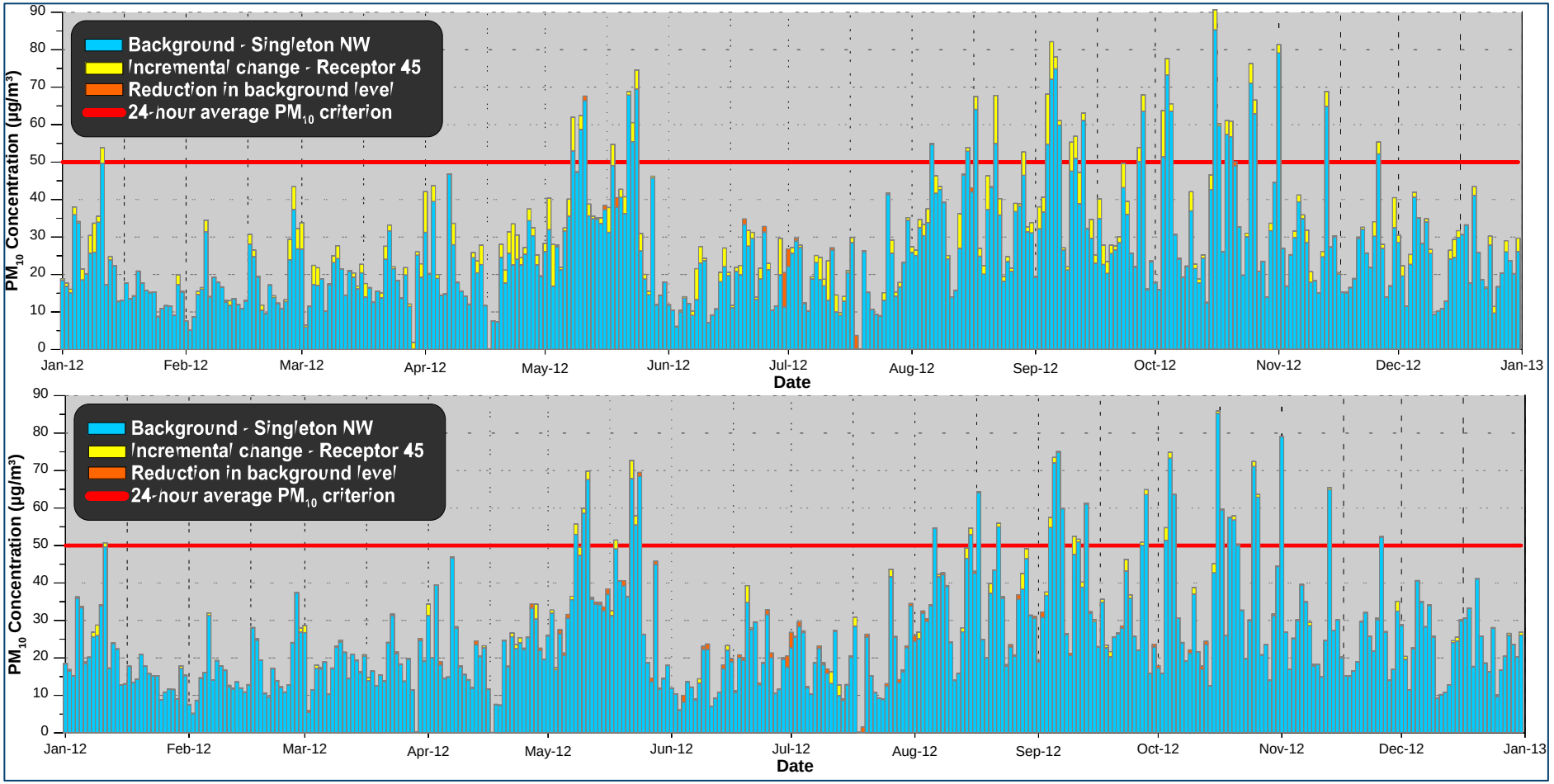


Figure 6-8 Predicted 24-hour average PM_{10} concentrations for Receptor 45 in Year 2023 and 2026

6.4.3 Estimates of Particulate Matter arising from Wind Erosion

Issue Description

The EPA has previously queried the estimates of particulate matter arising from wind erosion as the areas set out in the revised AQIA are considerably smaller than previous estimates. Todoroski Air Sciences advised the EPA that work conducted as part of the Pollution Reduction Program (PRP) for EPL 3391 shows that much of the area has been "stabilised". This is listed as a reason for excluding it from further consideration.

The EPA notes the measurements taken at the mine and presented in PRP report titled '*Coal Mine Particulate Matter Control Best Practice Final Licence Variation Notice – Exposed Area Assessment*' (Bloomfield, 2015). Stabilised areas are still recognised in this report as a source of dust and should be included.

The EPA further notes that the Exposed Area Assessment acknowledges that the level of stability achieved across the site was due to recent heavy rainfall and inactivity on the stability test areas due to the Christmas shutdown period.

Based on the above, all bare areas across the site are subject to wind erosion and should be included in the emissions inventory for the proposal. Active maintenance is needed to maintain stabilisation.

Response

As rainfall in the Hunter Valley is not uncommon, it would be incorrect to imply that rain or inactivity on a bare surface should be considered as extraordinary factors and not a normal circumstance that leads to reductions in wind erosion emissions. The PRP clearly shows that the bare surfaces on the site become stabilised after rainfall and demonstrates actions by Bloomfield to ensure that inactive areas remain untouched. This is the situation for the majority of the site at any one time, as reflected in the modelling.

Dust emissions due to wind erosion from the active areas in the AQIA have been estimated using an emission factor of 0.4 kg/ha/hour. This emission factor is conservative, and is four times higher than the emission factor of 0.1 kg/ha/hour set out in the Katestone document *NSW Coal Mining Benchmarking Study: International Best Practise Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining* (Katestone, 2011).

For the same modelled quantity of emissions arising from wind erosion, **Table 6-4** presents the area that would be exposed to wind erosion when applying the emission factor of 0.4 kg/ha/hour as modelled and 0.1 kg/ha/hour per the standard emission factor. On this basis, the modelling results are equivalent to having wind erosion from an area four times larger than that specified in the inventory.

Table 6-4 Wind erosion areas for Rix's Creek Mine (ha)

Year	Inventory overburden area	Inventory active pit area	Inventory total exposed area, per 0.4kg/ha/year	Equivalent total wind erosion area, per 0.1kg/ha/year*
2012	44	34	78	312
2017	45	21	66	262
2020	32	25	58	230
2023	94	38	133	530
2026	58	62	120	481

*Based on emission factor from Katestone (2011).

Table 6-4 shows that the modelled emissions from wind erosion in the AQIA are representative of large exposed areas, up to 530 ha.

The modelling assumptions relating to wind erosion are considered to more accurately represent what actually occurs at large mines that are relatively small but dusty active mining areas and large, not dusty, inactive or stabilised areas.

Bloomfield already applies various measures to minimise dust emissions due to wind erosion as would continue to be implemented during the Project including:

- Minimising the area of disturbance;
- Rehabilitating inactive, completed areas as soon as feasible;
- Applying interim stabilisation on areas inactive for long periods; and
- Trafficable areas being clearly marked; and vehicle movements restricted to these areas.

6.4.4 Details on the Derivation of the Emission Rates of Nitrogen Dioxide (NO_2)

Issue Description

In the Todoroski Air Sciences letter to the EPA dated 15th October 2015, reference was made to work conducted by CSIRO stating that the maximum NO_2 in the plume is 63.3 kg. This is scaled by a factor of 1.5 to account for conversion of NO to NO_2 and generates an emission rate based on the blast lasting for five minutes. The approach taken is sound, but the derivation of 63.3 kg as an estimate of the maximum NO_2 released from blasting is not clear.

The CSIRO report – '*NO_x Emissions from Blasting Operation in Open Cut Coal Mining in the Hunter Valley*' (ACARP Project C14054) provides estimates of NO_2 by blasting as a ratio to tonne of explosive used. The report uses an average of 0.06 kg NO_2 per tonne of explosive with a range of 0.002 to 0.32. The blasts sampled in that report used from 60 tonnes of explosive to 565 tonnes of explosive. The report does not indicate whether the maximum represents worst case.

It is not clear how the proponent has derived the value of 63.3 kg. The noted high uncertainty suggests that to conservatively estimate emissions, the greatest proposed explosive charge should be multiplied by an estimate of the maximum emission flux.

The EPA requests the proponent provide further details on the derivation of the emission rate of NO_2 from blasting, including the amount of explosive assumed and the emission flux, or equivalent information.

Response

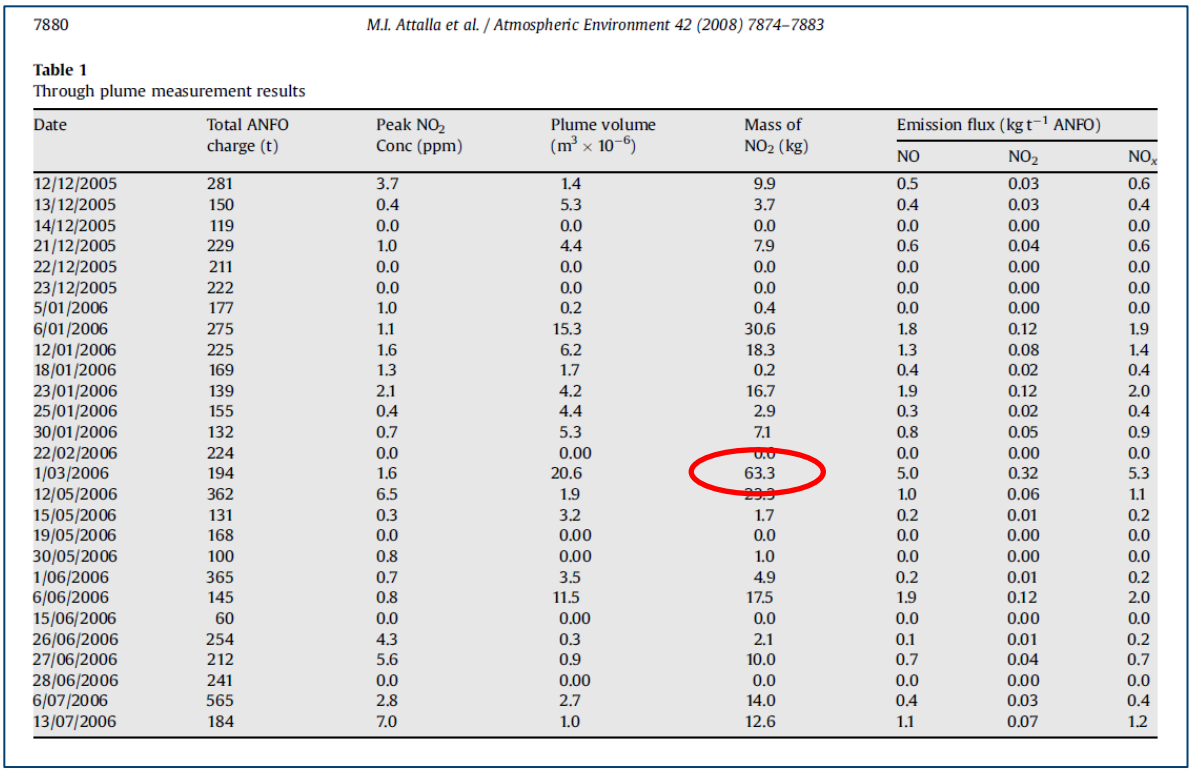
The emission rate of NO_2 was derived on the basis of the maximum mass of NO_2 emitted from any measured blast in the CSIRO study of Hunter Valley blasts (Attala et al., 2008). This value is 63.3kg and was obtained from Table 1 of the CSIRO study. The maximum mass of NO_2 was measured on 1 March 2006 (see **Figure 6-9** below).

The emission rate for NO_2 was derived on the basis of this mass of emitted NO_2, consideration of other corroborating information from confidential studies, and the assumptions set out in the AQIA for modelling the release of the NO_2 emissions from any blast.

Specifically, these assumptions were to increase the maximum measured rate by a factor of approximately 1.6 and to release all of the NO_2 emissions within a 5-minute period, i.e. 63.3 kg x 1.6 / 5 mins = emission rate (mass per unit time).

The data contained in the CSIRO study (Attala et al., 2008) suggests that there is no significant correlation between the amount of explosive used and the generation of NO_2 from a blast. The CSIRO and other contemporary studies show that blast fume emissions can vary greatly depending on a number of factors but are largely dependent on the tendency of a particular blast (or holes within the shot) to generate significant NO_2 emissions.

Accordingly, no assumptions were made in regard to the amount of explosive used, nor was any assumption or calculation made in regard to the emission flux per unit of explosive used.



7880 M.I. Attalla et al. / Atmospheric Environment 42 (2008) 7874–7883

Table 1
Through plume measurement results

Date	Total ANFO charge (t)	Peak NO_2 Conc (ppm)	Plume volume ($m^3 \times 10^{-6}$)	Mass of NO_2 (kg)	Emission flux (kg t^{-1} ANFO)		
					NO	NO_2	NO_x
12/12/2005	281	3.7	1.4	9.9	0.5	0.03	0.6
13/12/2005	150	0.4	5.3	3.7	0.4	0.03	0.4
14/12/2005	119	0.0	0.0	0.0	0.0	0.00	0.0
21/12/2005	229	1.0	4.4	7.9	0.6	0.04	0.6
22/12/2005	211	0.0	0.0	0.0	0.0	0.00	0.0
23/12/2005	222	0.0	0.0	0.0	0.0	0.00	0.0
5/01/2006	177	1.0	0.2	0.4	0.0	0.00	0.0
6/01/2006	275	1.1	15.3	30.6	1.8	0.12	1.9
12/01/2006	225	1.6	6.2	18.3	1.3	0.08	1.4
18/01/2006	169	1.3	1.7	0.2	0.4	0.02	0.4
23/01/2006	139	2.1	4.2	16.7	1.9	0.12	2.0
25/01/2006	155	0.4	4.4	2.9	0.3	0.02	0.4
30/01/2006	132	0.7	5.3	7.1	0.8	0.05	0.9
22/02/2006	224	0.0	0.00	0.0	0.0	0.00	0.0
1/03/2006	194	1.6	20.6	63.3	5.0	0.32	5.3
12/05/2006	362	6.5	1.9	23.3	1.0	0.06	1.1
15/05/2006	131	0.3	3.2	1.7	0.2	0.01	0.2
19/05/2006	168	0.0	0.00	0.0	0.0	0.00	0.0
30/05/2006	100	0.8	0.00	1.0	0.0	0.00	0.0
1/06/2006	365	0.7	3.5	4.9	0.2	0.01	0.2
6/06/2006	145	0.8	11.5	17.5	1.9	0.12	2.0
15/06/2006	60	0.0	0.00	0.0	0.0	0.00	0.0
26/06/2006	254	4.3	0.3	2.1	0.1	0.01	0.2
27/06/2006	212	5.6	0.9	10.0	0.7	0.04	0.7
28/06/2006	241	0.0	0.00	0.0	0.0	0.00	0.0
6/07/2006	565	2.8	2.7	14.0	0.4	0.03	0.4
13/07/2006	184	7.0	1.0	12.6	1.1	0.07	1.2

Figure 6-9 Extract of Table 1 from CSIRO study of Hunter Valley blasts (Source: Attalla et.al, 2008)

6.4.5 Hunter River Salinity Trading Scheme

Issue Description

Section 15.3.5 of the EIS states that the mine is licensed for water discharge under current conditions of EPL 3391. Section 15.3.5 further notes "*the mine holds salt credits that would facilitate release of water under the conditions of the Hunter River Salinity Trading Scheme, if a discharge point is found to be necessary in the future*".

Currently EPL 3391 does not permit any discharges from the site. The EPA notes the Project does not propose the introduction of any licensed discharge points at the site. As such the EPA does not have any recommended conditions of approval specifically relating to surface water discharges.

Any future proposal to discharge from the site, including under HRSTS conditions, would require amendments to the EPL and development consent. This would require an assessment of potential impacts for any proposed discharge to waters.

Response

This is noted. Should a licensed discharge point be required in the future, an application would be made to amend the EPL and Project development consent, and this would include an assessment of potential impacts so that applicable agencies could undertake a thorough assessment

6.4.6 Environment Protection Licence

Issue Description

If Project approval is granted amendments would be required to the current EPL 3391 premises. The proponent would have to make a separate application to the EPA to amend the existing EPL 3391 prior to undertaking any on site works associated with the expansion.

Response

This is noted, and an application to vary EPL 3391 would be made if approval for the Project is granted. No works would be taken outside of the EPL 3391 premises until this application is approved.

6.4.7 Recommended Conditions of Approval

Issue Description

The EPA recommended a number of conditions to be incorporated into the conditions of approval for the Project, if granted. These related to noise limits, noise monitoring and noise reporting.

Response

The Project would be undertaken in accordance with the conditions imposed on the development consent and it is expected that these would take account of EPA's recommended conditions. It should also be noted that as of 3 August 2017 the EPL was varied to include the noise criteria as recommended in this application. These criteria would be maintained for the Project and would not require amendment in the updated EPL

6.4.8 Clarifications requested outside of the exhibition period

Correspondence dated 15 November 2016 was received from the EPA following their review of the original Response to Submissions Report. The EPA raised additional questions in regards to:

- Providing clarifications in regards to properties that may experience exceedances of the PM_{10} 24hour criteria;
- Further quantifying potential diesel fume emissions;
- Potential impacts to receivers at Maison Dieu, the Country Acres Caravan Park and Maitland Diesel Service; and
- Provide additional figures depicting the following scenarios for the revised mining schedule:
  - All years maximum 24-hour average PM_{10} at 50µg/m³ with proposed mitigation in place;
  - All years 24-hour average PM_{10} at 50µg/m³, identifying acquisition areas; and
  - Cumulative for all year's annual average PM_{10} at 30µg/m³.

Each of these elements is discussed below and a formal response from the Project air quality specialist is provided at **Appendix H.**

Issue Description

The EPA indicated that there is no comment regarding the six receptors assessed as experiencing additional exceedances on a cumulative basis but not exceeding due to Project-only emissions.

Response

The Project Air Quality Impact Assessment (AQIA) provides a comprehensive assessment of the potential cumulative 24-hour PM_{10} impacts that may arise due to the Project. In Section 9.6 of the AQIA, the assessment examines cumulative 24-hour PM_{10} impacts. The assessment follows the EPA's approved methods, and is made by conducting a detailed analysis at ten receptors, including the six receptors that EPA appears to be referring to (R19, R51, R140, R151, R163 and R164).

The executive summary in the AQIA also identifies that nine receptors are predicted to experience elevated dust impacts. All of these receptors are predicted to experience cumulative annual average dust levels above the applicable NSW EPA impact assessment criteria and the criteria in the NSW Voluntary Land Acquisition and Mitigation Policy (VLAMP).

When reviewing the results of the AQIA the differences between the NSW EPA impact assessment criteria and the VLAMP impact assessment criteria for 24-hour average PM_{10} impact need to be recognised. The EPA criterion identifies impacts that may or may not be significant. The VLAMP identifies a subset of the EPA impacts that are significant at two levels:

- Significant enough to warrant mitigation; and
- Significant enough to warrant acquisition.

The AQIA makes comment in regard to these receptors and predicted that they would experience additional cumulative 24-hour average PM_{10} impacts per the EPA assessment criteria, but that the

impacts are not significant (i.e. acceptable per the VLAMP without the need for mitigation or acquisition).

The EPA has taken data from Section 9.6 for the six receptors and has presented this data in its summary of impacts. It is unclear therefore why the EPA refers to there being 'no comment regarding the six receptors' in the assessment.

Reference is made to Section 9.6 of the AQIA which concludes that "All other privately owned receptors would experience less impact (except Receptor 1, which has an agreement in place with the Project)."

Issue Description

The EPA notes that the estimated change in $PM_{2.5}$ diesel combustion generated emissions as detailed in the original Response to Submissions Report is considerably greater than that of PM_{10} emissions. EPA notes that the Response to Submissions provided additional information in regards to diesel emissions generated from haul road traffic, however needs to consider other diesel emissions sources such as from loaders and dozers.

Response

The changes in the $PM_{2.5}$ emissions are calculated as instructed by EPA and are clearly shown in the information previously submitted. The table also shows the changes in the $PM_{2.5}$ impacts, which are of primary relevance to the assessment of impacts arising due to the Project. Whilst, the changes in the $PM_{2.5}$ emissions presented to the EPA are considerably greater than the changes in PM_{10} emissions (i.e. 11.1% vs 1.3%), the changes in the $PM_{2.5}$ impacts are also presented to the EPA in the same table and are clearly inconsequential to the assessment. For example, the EPA was advised that the maximum predicted $PM_{2.5}$ impact due to the Project is 1µg/m^3 at the most impacted private receptor, and similarly that the maximum predicted change in $PM_{2.5}$ impact due to the Project is 0.1µg/m^3.

It is further noted in the previously provided response that revisions to the Project due to the acquisition of the Integra Mine would result in the maximum impacts being lower than presented, and quantifies this to be approximately 20% less than shown. Therefore the maximum $PM_{2.5}$ impact would be approximately 0.8µg/m^3 due to the Project, and the change in $PM_{2.5}$ impact would be approximately 0.08µg/m^3. This change in the level of impact would have no bearing on the conclusions or findings of the assessment.

For clarification, the estimate of $PM_{2.5}$ emissions includes consideration of all sources, including loaders and dozers which were included in the modelling and in the assessment of potential impacts.

Issue Description

The EPA considered that cumulative assessment documentation is incomplete. Not all the receptors assessed as experiencing additional days exceeding the 24-hour PM_{10} cumulative impact assessment criterion are identified in the assessment documents.

Response

The AQIA, as described in **Appendix H,** provides a comprehensive assessment of cumulative 24-hour PM_{10} impacts comprising approximately 25% of the AQIA in the EIS and additional assessment work that has been conducted as requested by the EPA. The impacts at these identified receivers are described as:

- The number of days of cumulative 24-hour PM_{10} impact at the most impacted private receptors in the Gowrie and McDougal's' Hill area is not more than five days of impact in the year of greatest impact, and all other receptors in this area would have less additional days of impact at all other times; and
- The one additional day of cumulative 24-hour PM_{10} impact at the most impacted receptor in the area that the EPA now defines as Maison Dieu, in the year of greatest impact, is approximately 51.6µg/m^3. The impact arises due to a small increase in impacts from the Project when the background level is 50.0µg/m^3. The next most impacted receptor would experience a reduction in impacts due to the Project on this day, and is predicted to experience only one day of impact at a level of 50.1µg/m^3 when the background level is 48.2µg/m^3. On the basis of these results and as it is known that the impacts due to the Project at all other receptors in this locality would be lower,

it is estimated that there would not be additional days of impact due to the Project at any other receptor, beyond that presented in the assessment. If however there are additional days of impact, any such effect due to the Project would be low and well within the level of accuracy or measurement in the OEH monitoring equipment.

A detailed time series assessment of cumulative impacts at the most impacted receptors is provided in the AQIA, specifically Figures 9.2 to 9.9 in the AQIA, and the updated figures provided in the original Response to Submissions Report for receptor R45. This shows a general decrease in impacts over the life of the Project.

Issue Description

The EPA requested that the following additional figures be provided for the revised mining schedule:

- All years maximum 24-hour average PM_{10} at 50µg/m³ with proposed mitigation in place;
- All years 24-hour average PM_{10} at 50µg/m³, identifying acquisition areas; and
- Cumulative for all year's annual average PM10 at 30µg/m³.

Response

The figures requested by the EPA are provided at **Figure 6-10**, **Figure 6-11** and **Figure 6-12** respectively.

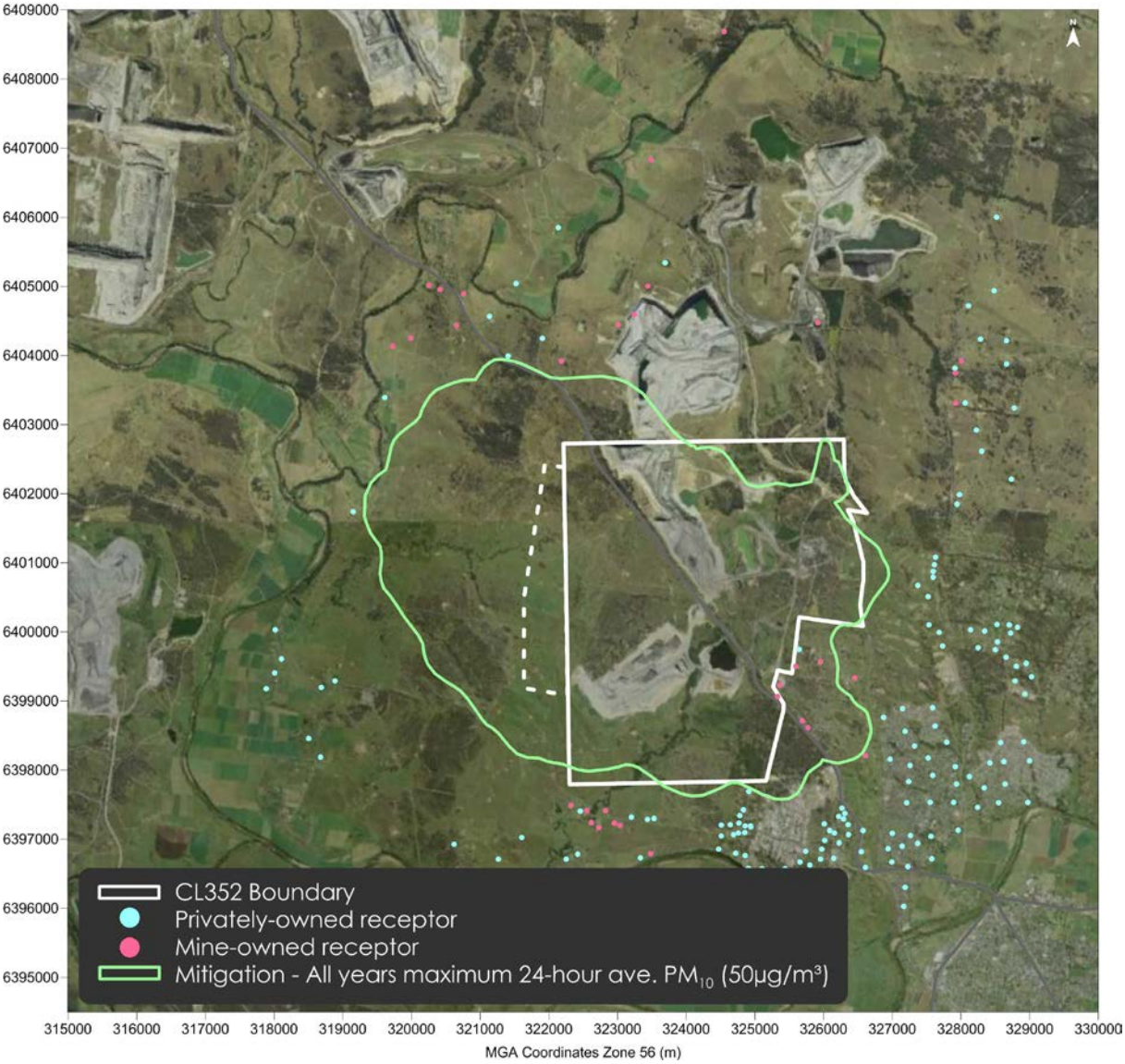


Figure 6-10 All years maximum 24-hour average PM_{10} at 50µg/m³ with proposed mitigation in place

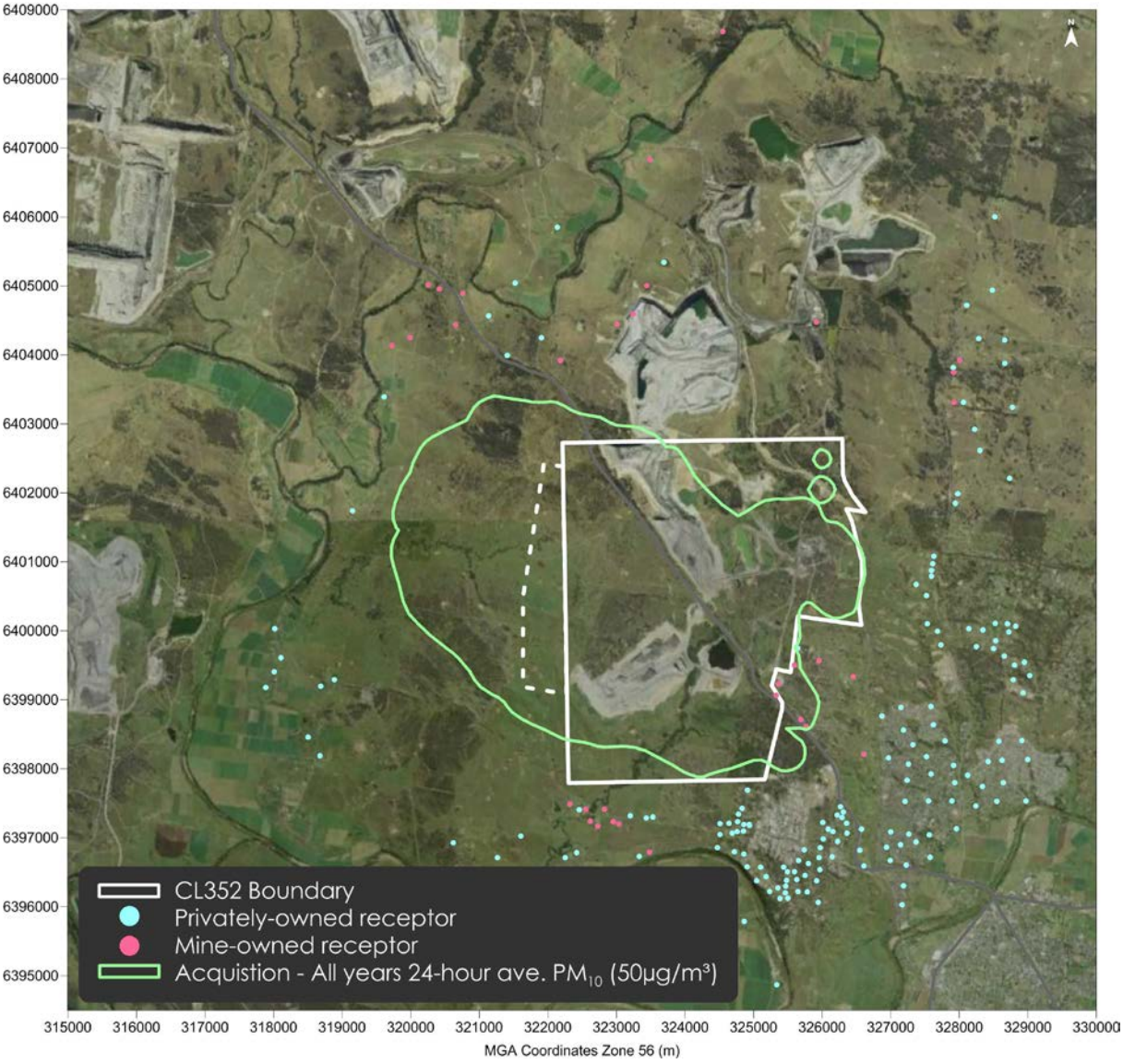


Figure 6-11 All years 24-hour average PM_{10} at 50µg/m³

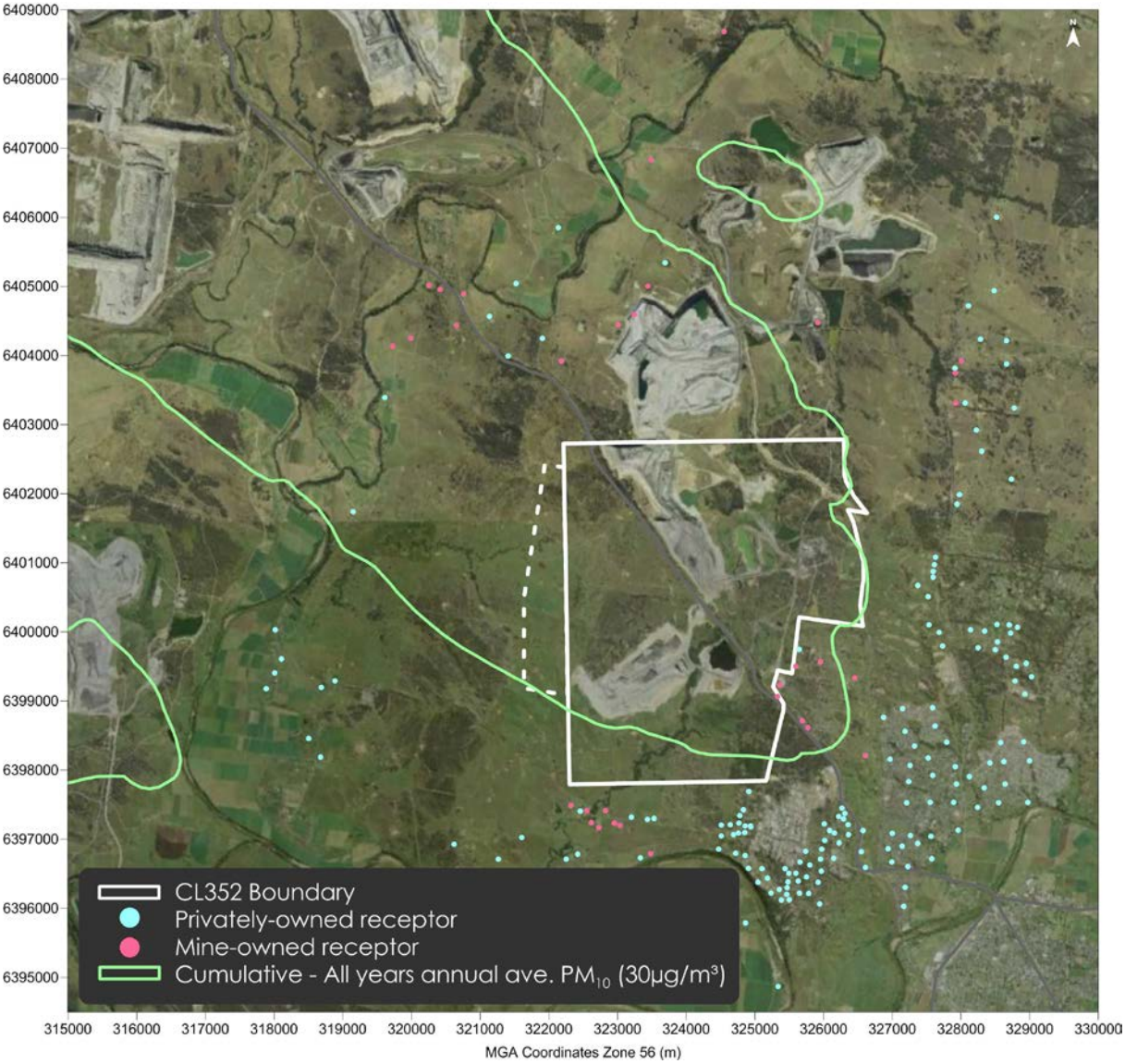


Figure 6-12 Cumulative for all year's annual average PM_{10} at 30µg/m³.

6.5 Hunter New England Population Health

6.5.1 Air Quality

A response to the air quality issues raised by Hunter New England Population Health has been prepared by the air quality consultant Todoroski Air Sciences. A full copy of the response is provided at **Appendix H.**

Issue Description

It is important that the EIS should address the likely future air quality standard for annual average PM_{10} of between 20 and 25 µg/m³ and annual average $PM_{2.5}$ of 8 µg/m³, as flagged in the *Proposed variation to the Ambient Air Quality NEPM*. While the EIS states (on page 102) that the "Air quality impacts were assessed having regard to the World Health Organisation (WHO) Air Quality Guidelines (2005) for particulate matter", the EIS did not use the annual goal of 20 µg/m³ recommended by WHO in the document. Our focus in this review is on average annual particulate levels because this measure is most predictive of health impacts and $PM_{2.5}$ is considered to have more significant health impacts than PM_{10}.

Response

NSW Health is referring to the summary of the AQIA in the main body of the EIS. The complete AQIA report is included as Appendix L to the EIS and addresses the likely future annual average $PM_{2.5}$ and PM_{10} impacts that may arise due to the Project. The predicted impact at each location is explicitly tabled, and contour diagrams are provided in the AQIA report.

Overall, the assessment shows that the Project would reduce impacts on the population as it moves further away from the main population areas. In 2023, impacts were assessed to have potential to increase temporarily above the decreasing trend, before decreasing again in future, however this period of increased activity (in 2023) is no longer proposed, and the impacts in 2023 would be less than those assessed.

In Section 14 of the AQIA, a comparison of the proposed Project impacts with the approved impact zone shows that the proposed Project would have a greatly reduced zone of impact. It must also be noted that reduced impacts would occur due to improvements in mining methods (i.e. since the original approval), and also the proposed Project design.

The assessment explicitly considers the most relevant health metric (annual average $PM_{2.5}$) and makes an assessment in accordance with the NEPM advisory reporting standard in this regard.

It is important to note that NEPM air quality standards are not designed to be applied to specific Projects. The NEPM standards apply to the average exposure to air pollutants of the general population, in each state. The NEPM requires that the states report to the Commonwealth on the trends in air quality by way of reference to the standards.

Potential air quality impacts from individual Projects on individual residents are compared to impact assessment criteria. Whilst at the time of preparing the AQIA, it was known that the NEPM was under review, the NEPM goals were not known or agreed, and it is not presently known if any revised goals might be applied in some form as future impact assessment criteria.

On page 104 in the main body of the EIS, in the section outlining the criteria applied, under the subheading of health impacts, it is stated that: *"Assessment of potential human health impacts has been carried out by reference to the WHO criteria and NEPM reporting standard for $PM_{2.5}$."* This is consistent with NSW Health's focus in its review, and the AQIA includes PM_{10} impact contours at the 20 µg/m^3 level.

The WHO considers that health impacts are most closely correlated with $PM_{2.5}$ levels, and has set health based criteria of 10µg/m^3 for annual average $PM_{2.5}$. The WHO uses PM_{10} criteria as a surrogate for its $PM_{2.5}$ health criteria as measuring $PM_{2.5}$ is costly and measurement is not as widespread as for PM_{10}. This allows the larger number of existing and generally more reliable PM_{10} monitors to be used to manage $PM_{2.5}$ levels, and protect health over a wider area.

The WHO PM_{10} criterion is set at 20 µg/m^3 (twice the level of the health based $PM_{2.5}$ criterion) as PM_{10} levels are generally twice the $PM_{2.5}$ levels in most jurisdictions that the WHO has assessed (mainly urban areas in the Northern Hemisphere).

The WHO states that where $PM_{2.5}$ and PM_{10} levels are known, the PM_{10} criteria can be adjusted to reflect the known fraction of $PM_{2.5}$. This means that in areas such as the Hunter Valley, where the $PM_{2.5}$ level is generally less than half of the PM_{10} level, a higher PM_{10} criterion would apply to manage health.

In the Hunter Valley, approximately 35%[1] of the PM_{10} in the ambient air is comprised of $PM_{2.5}$, hence the applicable WHO criterion for annual average PM_{10} would be approximately 29µg/m^3. If only the monitors outside of the three urban areas of Singleton, Muswellbrook and Denman are considered, $PM_{2.5}$ comprises approximately 33% of the PM_{10} and the annual average PM_{10} criteria that the WHO would apply to manage health effects would be 31 µg/m^3. Regardless, a level close to the NSW EPA criterion of 30µg/m^3 would be appropriate for the Hunter Valley.

[1] The $PM_{2.5}/PM_{10}$ ratio (up to 2015) at all of the thirteen EPA Hunter $PM_{2.5}$ monitors where PM_{10} data are also collected.

Issue Description

The village of Camberwell is inside the contours for modelled worst case annual $PM_{2.5}$ and PM_{10} goals (using 30 µg/m^3 as the goal) (Figures 11.7, 11.8, 11.9, 11.10 of the AQIA). Figures 11.9 and 11.10 of the AQIA depicting modelled worst case annual average PM_{10} only provide a 30 µg/m^3 contour. Displaying a 20 µg/m^3 and 25 µg/m^3 contour (as relevant to the goal promoted in the variation to the Australian NEPM) would be of great use in assessing the impact on the nearby settlements such as McDougalls Hill and Singleton Heights. While the Project may only contribute a small (but not insignificant) proportion of particulate emission to the local communities, it is the total impact that is important from a cumulative impact assessment perspective. The intensive mining in this area would likely exceed current and particularly future air quality goals making it difficult to argue that increased particulate emissions are acceptable from a cumulative impact perspective. There are multiple and significant impacts on receptors 170 – 177. The EIS appears to dismiss these impacts because the properties are eligible for acquisition, however, rights to acquisition do not diminish or negate the cumulative impact to these communities (page 111).

Response

NSW Health is potentially referring to the summary of the AQIA in the main body of the EIS. The complete AQIA report is included as Appendix L to the EIS. The AQIA includes incremental and cumulative contours shown in greater detail than in the main body of the EIS.

The impacts at residences in Camberwell and other properties in the vicinity are not intended to be dismissed because the properties are eligible for acquisition. Impacts at these locations arise due to the existing situation, irrespective of the Project, and the intention is to be clear that the impacts from all mines have been modelled, and to also show that these cumulative impacts are properly represented in the assessment. The Project makes very little difference to the levels of impact at these locations, and the predicted change would be well within any natural variation in the background levels of the ambient environment, or the modelling precision. The intention was to reasonably assess the predicted impacts in the context of the receiving environment.

To further quantify the potential impacts of the Project for receivers in Camberwell additional analyses were undertaken for receivers 170 – 177, with the exception of receivers 172 and 174 which have since been purchased by the Mine following the exhibition of the EIS. Details of this assessment are provided in **Appendix H.**

This analysis concluded that the predicted annual average PM_{10} impact due to the Project is relatively small in comparison to the other mining operations, with the exception of Receptor 171, where the contribution due to the Rix's Creek Mine in future years may be similar to the other mining operations. This receptor is currently afforded acquisition rights by other mining operations, and Rix's Creek Mine would also offer such acquisition rights.

6.5.2 Noise

Issue Description

The noise modelling in the EIS shows the potential for some significant exceedances of Project specific noise level in all Noise Assessment Groups (NAG) during worst case scenarios. It has been explained in the EIS that, in accordance with the above policy, as this is an existing development with noise legacy issues, where the modification would have beneficial or negligible noise impacts, that the development consent authority cannot grant voluntary mitigation and acquisition rights. The EIS also explained the noise mitigation measures being implemented to address these legacy noise issues. However, it would be preferable for the affected sensitive receivers if these measures were implemented sooner and that very strict controls were placed on operations during conditions that would lead to the noise levels predicted in Table 4.7: 90th Percentile Operational Predictions – LAeq, 15 minute dB.

Effective community consultation is required throughout the Project to facilitate public involvement and to allow for the community to participate in the mitigation selection process.

Response

The recent acquisition of the Integra Mine included acquisition of ten fully attenuated Caterpillar 789 rear dump trucks and one fully attenuated Caterpillar 994 loader. This would allow the coal fleet to be

fully noise attenuated, including the front end loader used to load the truck fleet. Only five coal trucks are typically in operation, so the remaining attenuated Caterpillar 789 trucks can be used for overburden haulage in critical areas during enhancing meteorological conditions. A Caterpillar 992K loader has recently been moved from the Bloomfield Mine in East Maitland to replace an older Caterpillar 992C loader, and is currently in use on the Mine's ROM coal pad.

These actions effectively result in earlier implementation of key noise control measures, which would reduce noise emissions in the earlier stages of the Project. The Mine has integrated into its noise management system the revised EPL noise criteria using L_{Aeq} 15min criteria not the L_{A10} noise goals used in the previous development consent.

The Mine has developed a contemporary noise management plan, which outlines procedures for managing noise during enhancing meteorological conditions. The procedures are based on a program of proactive forecasting, attended monitoring, and reactive measures involving modifying operations to reduce noise emission to acceptable levels when required.

Community consultation has been carried out throughout preparation of the EIS and during public exhibition of the EIS, as described in Section 9.2 of the EIS and in **Section 3.0** of this RRTS Report. Community and stakeholder consultation has continued during ongoing operation of the Mine and would continue for the Project in accordance with the Stakeholder Engagement Strategy prepared for the Project.

6.5.3 Blasting

Issue Description

In February the NSW Environment Protection Authority (EPA) announced the introduction of new conditions for open cut coal mines in NSW prohibiting the emission of blast fumes that are likely to cause offence to members of the public. The new licence condition states: "*offensive blast fume must not be emitted from the premises*". We emphasise the need to ensure strict control of blast conditions to protect the public from blast fume emissions.

Response

The potential for adverse impacts as a result of blast fume emissions was assessed in Section 11.4 of the EIS. The assessment identified that blasts occurring between 9.00am and 3.00pm pose little potential for adverse blast fume impacts to occur, while during the hours of 4.00pm to 5.00pm, there is potential for adverse blast fume impacts beyond the site boundary.

As noted in the EIS, the Mine currently operates in accordance with a Blast Fume Management Strategy. This includes use of a predictive blast management tool based on forecast weather data to determine if the upcoming conditions are suitable for blasting. These blast management tools indicate the potential extent of impact at various times during the upcoming day, and allow the operators to select the time of the day with the least impact to schedule the blast. Through the ongoing operation of this system over the life of the Project, adverse impacts as a result of blasting are considered unlikely, or in the event that they do occur, minor.

The Blast Fume Management Strategy lists the potential controls to be used for blast fume mitigation, such as sealing the top of stemmed holes with a gas bag. The Strategy also details the procedure for rating and recording post blast fumes, using the Visual NOx Fume Rating Scale. All blasts are video recorded and where a risk of post blast fume is identified, the blast is reviewed. In the event that a blast fume is rated as a minimum of three at its highest extent as it leaves the site, DP&E is notified and an investigation is undertaken. With the predictive blast management tool in place however, blasting is avoided during times of high predicted meteorological risk.

6.5.4 Surface Water

Issue Description

The EIS mentions one other licensed water user on Rix's Creek, and one other on the Un-named Tributary, that could be impacted by the reduction in catchment flows caused by the Project. However, Rix's Creek is an ephemeral stream with a flow rate of zero for 44% of the time. Presumably these two other water users are not using this water as a drinking water supply.

It is important that any private water users downstream have easy access to and can understand monitoring data. It is also important that, in the event that the water becomes unsuitable for use by private water users that an alternative water source of the same standard, quantity and quality is offered.

Response

Water quality monitoring results are easily accessible to the general public; they are provided on the website for the Mine at: http://www.bloomcoll.com.au/Environment/Rix'sCreek/EnvironmentalReports/tabid/251/Default.aspx.

The EIS noted that given the Rix's Creek catchment is predominantly dry, small reductions in catchment loss are not expected to alter existing stream hydrological values or resulting geomorphological or riparian regimes. Due to the ephemeral nature of the catchment, it is not known if Rix's Creek is used as a drinking supply for human consumption. Regardless it is unlikely that the Project would impact on downstream water quality due to spillages from the Mine Water Dam, and there is a low risk of impacts on water quality in the surrounding catchment due to ongoing mining operations. Runoff from working areas is captured for treatment (e.g. settling out of suspended sediments in a settlement pond) and tested in accordance with the Mine Water Management Plan. Further detailed discussion in regards to potential surface water impacts is provided in **Section 7.9.3** in response to submissions received by a community member.

6.5.5 Rainwater Tanks

Issue Description

The EIS does not mention issues associated with water quality from rainwater tanks at residences without a reticulated water supply. It is recommended that the applicant address the issue of potential impacts on rainwater quality that may be caused by dust from mining construction and operations.

The peak reference document in Australia for information in relation to rainwater tanks is enHealth's *Guidance on use of rainwater tanks* (2010). It would be appropriate to utilise this document and apply its recommendations and standards to rainwater tank systems within the vicinity of the development.

The above document states that "tanks should be inspected every 2-3 years for the presence of accumulated sediment. If the bottom of the tank is covered with sediment the tank should be cleaned". In addition, consideration should be given to the installation of first flush diverters to rainwater tanks to reduce the amount of sediment entering the tanks.

A management system of taking complaints and rectifying issues identified should be considered.

Response

The Air Quality Impact Assessment prepared for the EIS undertook dispersion modelling to assess the impacts of particulate matter generation resulting from the Project. Nine sensitive receivers were predicted to experience impacts above the relevant assessment criteria. One of these receivers has an existing negotiated agreement (including mitigation measures) for continuation of acquisition rights, and the other eight are located within the acquisition zone of other surrounding mines (i.e. they would experience an exceedance regardless of the Project). Otherwise, particulate emissions are predicted to be within the air quality criteria for the Project.

Air quality criteria have been developed specifically to protect the general health and safety and amenity of the community in relation to air quality. It is therefore considered unlikely that the Project would generate additional health impacts as a result of dust deposition in rainwater tanks. It is also noted that other sources of particulate matter would contribute to sediments found inside rainwater tanks, including vehicle emissions, wood smoke (from combustion of fires in urban areas as well as from bushfires), and wind driven dust.

Whilst the Mine is not responsible for the care and maintenance of rainwater tanks which are not under its ownership or control, it is noted that it would otherwise be the responsibility of the owners of the tanks to manage them in accordance with the enHealth's *Guidance on use of rainwater tanks* (2010) regardless of the Project proceeding. Additionally Bloomfield would consider, on a case by case basis (distance from site, prevailing wind conditions) cleaning of rainwater tanks.

The Mine would continue to implement the air quality management measures currently used to mitigate air quality emissions from its operations. These management measures are consistent with the best practice measures outlined in the NSW EPA document *'NSW Coal Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter*'.

The Mine operates a dedicated enquiry and complaints hotline. Complaints are managed through a complaints register which includes details of the complaint and follow up actions taken.

Cleanout of rainwater tanks would be considered for surrounding neighbours on a case by case basis.

6.6 Office of Environment and Heritage – Heritage Division

6.6.1 Recommended Conditions of Approval

Issue Description

The Heritage Division recommended a number of conditions to be incorporated into the conditions of approval for the Project, if granted. These related to the "Linear Embankment and Mound with Historic Material" and the "Rix's Creek Coke Ovens and Associated Works".

Response

The Project would be undertaken accordance with the conditions imposed on the development consent and it is expected that these would take account of OEH's recommended conditions.

6.7 Office of Environment and Heritage

6.7.1 Threatened Species Mapping and Offsetting

Since the submission of the EIS and RTS Bloomfield has engaged ecologists EMM to undertake further work in assessing the Project potential biodiversity impact and determining appropriate mitigation and offsetting. A full copy of EMMs response to submissions and biodiversity offsetting report the response is provided at **Appendix B.**

Issue Description

After receiving advice from the Australian Government Department of the Environment (DoE), OEH is of the opinion that the areas mapped as the Central Hunter Valley Eucalypt Forest and Woodland is incorrect.

OEH requested that updated mapping of the Central Hunter Valley Eucalypt Forest and Woodland and subsequent areas be provided.

Response

Since the submission of the EIS and the RTS, Bloomfield have engaged ecology consultants EMM to undertake verification of the vegetation mapping prepared as part of the EIS and revaluated the existing communities within the New Disturbance Area to confirm he potential impacts of the Project on the Central Hunter Valley Eucalypt Forest and Woodland. This work was undertaken to remove any ambiguity or perceived errors in the previously supplied assessment of the Central Hunter Valley Eucalypt Forest and Woodland. Updated vegetation community mapping is provided in **Appendix B.**

EMM identified four communities within the Project Area which are considered part of the CHVEF listing. These are:

- Bull Oak Grassy Woodland;
- Derived Native Grassland;
- Grey Box Grassy Open Forest; and
- Narrow–Leaved Ironbark–Native Ironbark.

Appendix B of this report provides an updated map, showing the extent of CHVEFW within the Project Area. The total area of CHVEFW within the Project Area is 47.12 ha, 17.62 ha of which is the woodland / forest form and 29.5 ha is derived grasslands linking larger woodland / forest patches. Other areas of derived grassland do not meet the definition of the CHVEFW community as listed under

the EPBC Act. The methodology for mapping CHVEFW has been through several iterations and was been developed between Dr Stephen Bell (Eastcoast Flora Survey) and Paul Hillier of OEH. The full detail of this process is outlined in a letter which is attached in **Appendix B**. It is noted that the extent of the state listed TECs and EPBC listed communities differ, this is due to the way patch sizes and buffer distances are applied around woodland areas and differences in the scientific determinations made by the NSW and the Commonwealth.

The Project was referred to the Department of Environment and Energy (DoEE) in September 2014 (EPBC Act Referral No. 2014/7348). A decision on the referral was made by DoEE on 21 November 2014 under Section 75 of the EPBC Act, determining that the Project was not a controlled action. This decision was made prior to the listing of CHVEFW (May 2015) and therefore no further assessment or approval of the project was required under the EPBC Act

Issue Description

The EIS appears to include incorrect ecosystem credit calculations. The calculation errors appear to have occurred in the Landscape Value Assessment component. OEH requested that these entries in the calculator be rectified as they can impact on the Project's credit requirements.

Response

Reason for Discrepancies in Credit Calculations

Values entered into the Landscape Value Assessment were revised to reflect updated values resulting from identification of the New Disturbance Area. The original credit calculation as included in the EIS included areas of DNG as 'native vegetation cover', when it was later advised by OEH that such areas should not be included. Other discrepancies identified included minor changes to Connectivity Value and Adjacent Remnant Area components. In addition, a typographical error in the number of hectares of DNG was detected in March 2016, which had not been identified in previous document reviews. As a consequence, a revision to the credit calculations was required.

To overcome any potential discrepancies associated with the previous UHSA credit calculation's Bloomfield engaged EMM to undertake revised calculation's for the Project. Assessment was also undertaken in accordance with the FBA methodology. This revised credit calculation also takes into account the New Disturbance Area as has been confirmed following the submission of the EIS and RTS.

Revised Credit Calculation

Regardless of the credit calculation error and subsequent correction provide in the EIS and RTS respectively, this RRTS is supported by new offset credit calculations using both the BCAM and FBA methodologies. Details of these credit calculations are provided in **Section 3.2** and **Appendix B.** These new calculations supersede previous calculations and any errors contained therein. Therefore no further consideration of the credit calculations provided in the EIS are required and only reference to the new credit calculation contained in this RRTS should be made.

Issue Description

OEH noted that the purchase of credits or any other form of offsetting is not regarded as mitigation. The mitigation of impacts on biodiversity will be undertaken in accordance with the draft UHSA '*Guidelines for the mitigation of coal mining impacts on biodiversity*'. Ecological rehabilitation will be undertaken in accordance with the draft UHSA '*Guidelines for the ecological rehabilitation of recognisable and self-sustaining plant community types*' where possible. These documents are currently in preparation.

Response

This is noted. Many of the mitigation measures described in the draft UHSA '*Draft Guidelines for the mitigation of coal mining impacts on biodiversity*' are already being implemented at the Rix's Creek Mine. These are detailed in the Rehabilitation Strategy prepared for the Project. For example, progressive rehabilitation of land is undertaken to minimise the area of disturbance and to rehabilitate these areas as soon as practicable post mining. The final landform has been designed to include a stable drainage network. Soil characterisation was undertaken to gain a detailed understanding of the soils capability of the area. The Rehabilitation Strategy details the growing media development

processes to achieve a soil which is capable of supporting a sustainable plant community. A range of land management practices are undertaken including weed management and control activities and a vertebrate pest animal management and control program. Land clearance is undertaken in accordance with the Land Disturbance Management Procedure, which includes the requirements for pre-clearance inspections and disturbance management measures.

In addition to these mitigation measures which are currently in place at the Mine and will continue to be implemented for the Project, the Mine proposes to offset the impacts through the purchase of ecosystem credits in accordance with the UHSA (or FBA as necessary) process described in the **Section 3.2**. Mitigation measures and rehabilitation to meet final landuse criteria will be undertaken in accordance with the relevant guidelines.

6.7.2 Clarifications Requested Outside of the Exhibition Period

Following submission of the EIS and RTS, OEH requested clarification on the mitigation and mine site rehabilitation for the life of the Project, including further consideration of the *UHSA Guidelines for the Mitigation of Coal Mining Impacts on Biodiversity*. The UHSA Guidelines present recommendations for reasonable and feasible actions to reduce local impacts on biodiversity from vegetation clearing and other mine operations. The implementation of these recommendations is not mandatory. The Rehabilitation Strategy proposed by Bloomfield at Rix's Creek Mine (Appendix Q of the EIS) provides an extensive list of mitigation and mine site rehabilitation measures that encompass the recommendations of the UHSA Guidelines. **Appendix B** details these measures, including discussion on whether the applicable recommendations of the UHSA Guidelines are met, as relevant to the Project. These mitigation measures include:

- Land form establishment, surface and groundwater management –establishing stable areas for rehabilitation to take place;
- Growing media – Producing topsoil suitable of sustaining plant growth and rehabilitation;
- Weed Management – Ongoing activities to reduce weed spread and competition;
- Pest and feral fauna management – Control of pest fauna species who can be damaging to newly established groundcover and plantings;
- Domestic stock – managing stocking rates at sustainable levels for the available pasture;
- Fauna movement structures – providing structure to encourage native fauna movement (e.g. stags);
- Bushfire management – maintaining safe fuel loads across the Mine;
- Preclearing surveys and tree felling supervision – Inspecting trees prior to and following felling and allowing time for fauna to vacate areas to be cleared; and
- Access control, signage and fencing – To prevent people and machinery from accessing and potentially damaging rehabilitation areas.

Each of these measures is described in detail in **Appendix B.** Prior to implementing mitigation measures it is important to understand the process of avoidance as implemented by Bloomfield during the mine plan development. OEH also requested additional information regarding the avoidance considerations in relation to the New Disturbance Area, including reasons why impacts to biodiversity cannot be further avoided. Importantly, there would be no disturbance of the northern section of the coal resource, north of Deadman's Gully, which is one of the most densely forested areas within the locality. The Project has limited scope to apply the avoidance hierarchy as the coal resource occurs within a discrete area and is directly adjacent to the currently exploited resource. Avoidance of small patches of areas with heightened biodiversity value would not be economically viable or practical given the scale of the open cut operations. Furthermore, this is not advantageous ecologically as any remaining habitat would be discontinuous with poor connectivity.

Avoidance principles are more effectively applied for associated infrastructure, especially where it is linear such as access roads or transmission lines. However in this case, the Project Area is part of an existing mine operation with most of the infrastructure already present, and the coal resource is within a disturbed landscape where biodiversity values are already reduced.

Operational Procedures

As part of the EMS in operation at the Mine, there are a range of existing policies aimed at mitigating impacts to biodiversity. Prior to clearing or impacting vegetation, the Land Disturbance Management procedure is followed which provides Mine staff with a process to be followed in order to obtain a Permit to Disturb. This permitting process is aimed at identifying potential impacts of the proposed disturbance and implementing measures to alleviate these impacts.

In addition, longer-term planning at the Mine has been undertaken to return appropriate levels of biodiversity to impacted areas as the Mine progresses as detailed in:

- Mine Operations Plan / Rehabilitation Management Plan – Sets long term goals for the progression of the Mine and areas to be rehabilitated and provides details regarding the implementation of rehabilitation activities in order to achieve the best rehabilitation outcomes for disturbed areas; and
- Mine Closure Plan – provides a framework for the end state of the Mine and final land use goals, including biodiversity goals, following the completion of the Project.

These plans would be reviewed and updated as necessary as part of the Project to incorporate those management measures listed above and summarised in **Section 8.0**.

Management and Monitoring

There is the potential for native fauna to be displaced from habitat during native vegetation clearing. To avoid adverse impacts on wildlife, significant ecological features associated with standing and dead timber would be assessed and monitored. A qualified and experienced fauna consultant would conduct pre-clearance surveys to ensure displaced wildlife is removed or relocated at the time of clearing.

The felling of trees would be undertaken after careful inspection of hollows is completed by a qualified fauna ecologist, prior to and immediately after tree felling. Felled trees supporting hollows would be stockpiled for later use in rehabilitation activities.

Consideration would be given to implementing speed limits in areas which have elevated risk of collisions with wildlife.

Mining would be undertaken in a manner that would allow for the gradual dispersal of wildlife into surrounding lands, and the ongoing development of rehabilitated areas on lands already mined. Consequently, it is envisaged that the cumulative impacts on wildlife would be negligible, and no monitoring is considered necessary.

Offsetting

Offsetting the required number of credits is the final option where impacts to biodiversity cannot be avoided or minimised. This RRTS Report has provided a calculation of the credits required in order to achieve the appropriate level of offsetting required by the Project. As previously detailed, this credit calculation was prepared by an accredited BioBanking assessor.

In accordance with the Draft Guidelines for the mitigation of coal mining impacts on biodiversity Upper Hunter Strategic Assessment (OEH, 2015), and the Upper Hunter Strategic Assessment Risk Categories and Associated Offsetting Requirements (OEH, 2016), Bloomfield has initiated the process of obtaining the required offsetting credits for the Project. As part of the Project Bloomfield has undertaken reasonable steps to demonstrate that attempts have been made to obtain credits in accordance with the UHSA. A summary of these measures is detailed in **Table 6-5.**

Table 6-5 Reasonable Steps to Demonstrate Attempts to Secure Credits

Reasonable Steps	Bloomfield Actions
Check the approved public register for offset sites (currently the BioBanking public register) and have an expression of interest for credits on it for at least six months.	Bloomfield listed its credit requirements on the Credits Wanted Register on 14 March 2016. No confirmation of credit availability was received prior to the publication of this report.
Liaise with an OEH officer and relevant local councils to obtain a list of potential sites that meet the requirements for offsetting.	Currently underway.
Consider properties for sale in the required area.	Currently underway. Bloomfield is reviewing available properties that may provide potential to source credits.
Provide evidence of why offset sites are not feasible – suitable evidence may include: • The unwillingness of a landowner to sell or establish an approved offset site; and • The cost of an offset site itself should not be a factor unless it can be demonstrated the landowner is charging significantly above market rates.	Subject to further investigation of the above points.

Bloomfield has reviewed the steps outlined **Table 6-5** to incorporate the new credit requirement. Since confirmation of the new credit requirements for both BCAM and FBA methodologies, Bloomfield has incorporated the new number of credits required into its sourcing of offsets.

In the event that the UHSA has not been finalised prior to determination of this Project, Bloomfield would enter into a Voluntary Planning Agreement (VPA) with the Minster for Environment. The VPA will be an offer of an amount of money, calculated utilising current monitory credit values that will satisfy the offset requirements.

To further demonstrate Bloomfield's commitment to providing the Projects required offsetting requirements, regardless of the pathway used (BCAM / FBA) an offsetting strategy was developed as contained within Section 5.0 of **Appendix B.** The strategy includes the following key steps:

1. Identifying if suitable credits are available on the market to meet offset requirements;
2. Finding potential on-site or off-site offset sites with the biodiversity values required to compensate for the project's impacts. Note that Bloomfield has already engaged ecologists to review their landholdings for potentially suitable offset sites;
3. In the absence of suitable offset credits or properties, applying the variation criteria rules of the FBA and finding suitable offsets to meet the requirements; and
4. Payment into the Biodiversity Conservation Trust.

Due to the variability in the markets, credit availability and uncertainty in regards to the UHSA process this strategy provides surety that Bloomfield can achieve its required offsets.

Commonwealth Referral

Pursuant to the provisions of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) projects that have the potential to impact upon matters of National Environmental Significance should be referred to the Commonwealth Department of Environment and Energy to determine if additional assessment and approval requirements are necessary pursuant to that legislation.

The Project was referred (EPBC Act Referral No. 2014/7348) to the Commonwealth Department of Environment and Energy in September 2014. The Project was reviewed on the referral information. The referral information included consideration of the entire Project Area, including the Addendum Area, existing mining areas and areas that are likely to be mined between the time of referral and the determination of SSD_6300.

A decision on the referral was made by the Department on 21 November 2014 under Section 75 of the EPBC Act. This decision confirmed that the Project was not a controlled action. As a result of this decision no further assessment or approval of the Project was required pursuant to the EPBC Act.

Given that the Project was determined to be not a controlled action, and that this decision was made taking into consideration the entire site footprint, not just areas proposed to be disturbed as part of the Project, this decision remains valid for the New Disturbance Area. Therefore no further assessment or evaluation of this area is required under the EPBC Act.

6.7.3 Conclusion

An appropriate amount of offset credits have been determined by an accredited BioBanking practitioner, in consultation with OEH, to offset Project impacts. The offsetting strategy would be enacted by Bloomfield should the Project be approved in order to ensure the Projects offsetting requirements can be met.

6.7.4 Aboriginal Cultural Heritage

Issue Description

OEH concurred with the archaeological survey's assessment of scientific significance of newly and previously recorded Aboriginal sites within the Project Area and made recommendations related to preparation of an Aboriginal Cultural Heritage Management Plan.

Response

As per the commitment made in Ref# 17.5.1 of the Management and Mitigation Measures provided in Table 29-1 of the EIS, an Aboriginal Cultural Heritage Management Plan would be prepared for the Project. This plan would be prepared in consultation with the OEH and the appropriate community groups. The OEH submission noted its support for the proposed key components of the Aboriginal Cultural Heritage Management Plan for the Project. The Project would be undertaken in accordance with the commitment made in Ref#17.5.1, Table 29-1 of the EIS.

6.7.5 Flooding

Issue Description

As no flood assessment has been undertaken, OEH recommended that a risk assessment is undertaken of the potential impact of a full range of flood events up to the Probable Maximum Flood (PMF), on the proposed water and sediment management dams. OEH requested that the concerns are appropriately addressed prior to Project approval. Detailed comments were provided in Attachment A of the OEH submission.

Response

A review of potential flooding impacts on the Project was undertaken by JP Environmental. A copy of the Flooding Report, including figures showing modelled flood extents, is provided at **Appendix I** and a brief summary is provided below.

The Flooding Report utilised flood frequency analysis and regional flood estimation to calculate a 1% Annual Exceedance Probability (AEP) peak flow and to determine a peak flow for the PMF (Extreme flood).

The report found that flooding in the Hunter River does not impact on operation of the Mine. The influence of flooding in the Hunter River on flood water levels in Rix's Creek does not extend any further upstream than approximately 175 metres from the toe of the nearest rehabilitated slope and about 500 metres along the Creek into the Project Area. Sensitivity analyses indicate that if the Extreme Flood level were 1 metre higher, the impact is unchanged.

The flood extents arising from modelled peak flows indicate that, where water levels are not influenced by structures placed within the stream, the Extreme Flood is contained within the floodplain. Average flow velocities on the floodplains for the 1% AEP flood are less than 1.2 m/s. For the Upper Limit 1% AEP, 91% of average velocities are less than 1.2 m/s and the highest average value is 1.6 m/s. For the extreme flood, 80% of average velocities are less than 1.2 m/s and the highest average value is 2.2 m/s. The floodplains generally have tree cover or are well grassed and the soils should withstand the short term velocities.

At the nearest points on Rix's Creek near the Pit 2 tailings dam, modelling indicated that water inflows at the tailings dam are likely to occur under each flow scenario modelled. As Pit 2 is an inactive pit which has recently been used for tailings emplacement and will soon be rehabilitated there would be no significant implications of minor flooding. The existing berms along the edge of the active mining area provide protection for the 1% AEP Upper Limit Flood. Under the Extreme Flood scenario, water inflows to Pit 3 are likely to occur at low points in berms around the perimeter of the open cut. Areas of the active mine and the decommissioned Pit 2 tailings dam would be subject to inundation.

Under the Extreme Flood scenario, one sediment trap is submerged. No sediment traps or dams are impacted under any of the other modelled scenarios. Rehabilitation in this area is mature and as the average velocity on the floodplain at this location is modelled at 0.41 m/s, erosion is considered unlikely.

Water approaches but does not reach the toe of the Pit 3 rehabilitation on the right (western) bank in the 1% AEP and the Extreme Flood scenarios. In each case the velocity is less than 0.51 m/s, and erosion is considered unlikely.

The culvert crossing beneath the New England Highway conveys the Extreme Flood. The modelled maximum water level is about 0.8 metres below the crown of the culvert and more than 2 metres below the road shoulder. Roads and Maritime standards only require the culvert to convey the 1:100 ARI flood.

The Flooding Report also identified that the overtopping of the two mine haul road culverts, to the south of the New England Highway, has the potential to cause localised erosion, although the upstream and downstream channels at each culvert are not eroded and the embankment faces show no evidence of erosion. The short term and infrequent nature of the overtopping events warrant no more than repairs if the culverts overflow during the life of the operation and damage occurs.

However, inundation of the Pit 3 open cut and Pit 2 tailings dam due to elevated flood levels at the culvert crossings to the Pit 3 and Pit 2 tailings dams could cause personal safety, economic and environmental impacts. Mitigation measures were proposed to prevent inflows for floods up to the 1% AEP flood in Rix's Creek. The Mine has included this hazard in the recent review of its Core Risk Assessment and has placed the completion of the mitigation measures (hazard control) into the short term planning schedule.

The Flooding Report concluded that there are threats from inundation to the Pit 2 tailings dam under all flood scenarios modelled. The Pit 3 open cut is currently protected from flooding up to the 1% AEP Upper Limit Flood, however the integrity of the existing berms did not form part of the study. The report recommended the following actions, including:

- Protect the open cut and the Pit 2 tailings dam from inflows due to the 1% AEP Upper Limit flood in Rix's Creek;
- Incorporate review of flood protection measures into the design systems of the mine, specifically for Pit 3 along Rix's Creek. The purpose is to ensure containment berms are of adequate height and integrity to withstand the 1% AEP Upper Limit flood in Rix's Creek;
- Review the integrity and height of existing berms along the perimeter of Pit 3, upstream of the culvert crossing to Pit 2 tailings dam; and
- Ensure that the minimum 35 m floodway width at the culvert crossing to Pit 2 tailings dam is maintained.

The report also noted that for future proofing, it may be prudent to allow for later modification of freeboard to meet the design standards being developed for the latest version of Australian Rainfall and Runoff.

Bloomfield has implemented the recommendations identified in the Flooding Report.

Specifically Bloomfield indicated it would construct a continuous embankment between Rix's Creek and the Pit 2 tailings dam to 71m AHD. Since the preparation of the EIS and RTS these embankments have been completed. This provides the required protection of the open cut, Pit 2 tailings dam and Pit 3 cut.

6.8 Roads and Maritime Services

6.8.1 Recommended Conditions of Approval

Issue Description

The RMS recommended a number of conditions to be incorporated into the conditions of approval for the Project, if granted. These relate to preparation of a Works Authorisation Deed, Construction Traffic Management Plan and design specifications for the cut and cover tunnel (bridge) and associated Side Track Road.

Response

The Project would be undertaken in accordance with the conditions imposed on the development consent and it is expected that these would take account of RMS's recommended conditions.

As specified in Ref#18.6 of the Management and Mitigation Measures in Table 29-1 of the EIS, a Construction Traffic Management Plan would be prepared for the Project. The EIS provided indicative concept designs for the cut and cover tunnel. As noted in Section 18.5.4 of the EIS, '*the final design would be confirmed in consultation with the RMS*', and this would include consideration of the comments provided by RMS in Attachment A of its submission. Prior to any works taking place a Works Authorisation Deed would be required to be entered into between Bloomfield and RMS.

6.9 Singleton Council

6.9.1 Noise and Air Quality

Issue Description

Whist the Council has no significant issues of concern, it is important that the noise and air quality impacts described in the EIS are comprehensively assessed by the technical experts in these areas to validate the modelling.

Response

This is noted, and the submissions from government agencies summarised in **Section 6.0** this RRTS Report demonstrate that these issues have been comprehensively assessed by the relevant technical experts.

6.9.2 Future Residential Areas in North Singleton

Issue Description

Council is currently considering a Planning Proposal seeking to rezone land to residential in North Singleton, west of Bridgman Road and north of Gardner Circuit. While it is acknowledged mining operations are moving away from Singleton it is not clear from the EA the extent of, if any, noise impact on this area having regard to future residential land uses.

Response

Additional detail about this issue is provided in **Section 7.9**, which includes a response to a public submission about a specific parcel of land within that area which is proposed for rezoning to a residential land use. The noise consultant Global Acoustics has undertaken additional noise reporting to address this issue, and a copy of the response is provided at **Appendix J.**

While not specifically included in the original vacant land assessment, the land being considered for rezoning in North Singleton was included in the acoustic assessment by generating noise contours over the area (refer to Figure 12-4 of the EIS). This approach is standard practice for assessing vacant areas, where individual residences are not present. To improve the accuracy of the noise contours in the area, the models have been reprocessed with a higher density of receiver points over the subject lots. Updated noise contours which cover that area of North Singleton are provided at **Appendix J** of this RRTS report.

6.9.3 Potential Visual Impact on from the Project

Issue Description

It is acknowledged that the existing visual environment along the New England Highway is impacted due to the current operations. The proposal would continue to impact within this corridor; however it is considered that the proposed progressive screen planting seeks to minimise impact in this regard. The EA notes that two residences to the south of the Project Area, located in Maison Dieu Road, would be visually impacted, however this would be mitigated by progressive screen planting along with rehabilitation.

Response

This is noted. As detailed in Section 21.5 of the EIS, progressive rehabilitation consists of extensive planting of grasses, shrubs and tree species, as soon as possible on newly formed landforms. Localised vegetation screens would be established in certain locations (for example, along the length of the New England Highway, particularly on the western side of the Highway) to reduce the visual impact on sensitive receivers. The Mine would also consider installation of additional localised vegetation screens if feasible, where visual impacts are identified by the community to be high during operation of the Project.

A Visual and Landscape Management Plan would be prepared to manage the potential visual impacts of the Project. This Plan would consider design and location of lighting to avoid direct line of sight and minimise light spill, progressive rehabilitation and tree planting, and retention of existing tree cover and vegetation where reasonable and feasible. Landscaping works, including shrub and tree planting, would be progressive throughout the life of the Project and these areas would be maintained to optimise visual screening.

In order to provide a better indication of the existing nature of the Mines rehabilitation works and how they have been progressively designed and undertaken to be consistent with natural landforms, a number of plates have been prepared to illustrate current Mine rehabilitation works. The viewpoint locations from which these images where taken are detailed on **Figure 6-13**, with the viewpoints detailed on that figure corresponding to the following:

- Viewpoint No.1 – West pit rehabilitation – North 1. Refer to **Plate 6-1**;
- Viewpoint No.2 – West pit rehabilitation – North 2. Refer to **Plate 6-2**;
- Viewpoint No.3 – West pit rehabilitation – South 1. Refer to **Plate 6-3**;
- Viewpoint No.4 – West pit rehabilitation – South 2. Refer to **Plate 6-4**;
- Viewpoint No.5 – West pit rehabilitation – South 2. Refer to **Plate 6-5**; and
- Viewpoint No.6 – Existing West Pit Rehabilitation (Maison Dieu Viewpoint). Refer to **Plate 6-6.**

The chosen viewpoints are representative of existing onsite examples of the sites progressive rehabilitation. Reference is also made to **Section 7.13.2** which provide illustrated examples of the established and progressive planting screenings along the New England Highway corridor

6.9.4 End of Mine Planning

Issue Description

There is a significant discussion being held with the mining community regarding end use of mine sites and particularly final land forms and voids. As this is an ongoing discussion with industry being an active participant, it is requested that any conditions are flexible in order to enable adaptive end of mine planning which is responsive to community and industry positions over time.

Response

This is noted.



\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions\60289290 F5-10 Rehabilitation Photograph Viewpoint Locations 07 11 2017 TO

AECOM

REHABILITATION PHOTOGRAPH VIEWPOINT LOCATIONS

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 6-13

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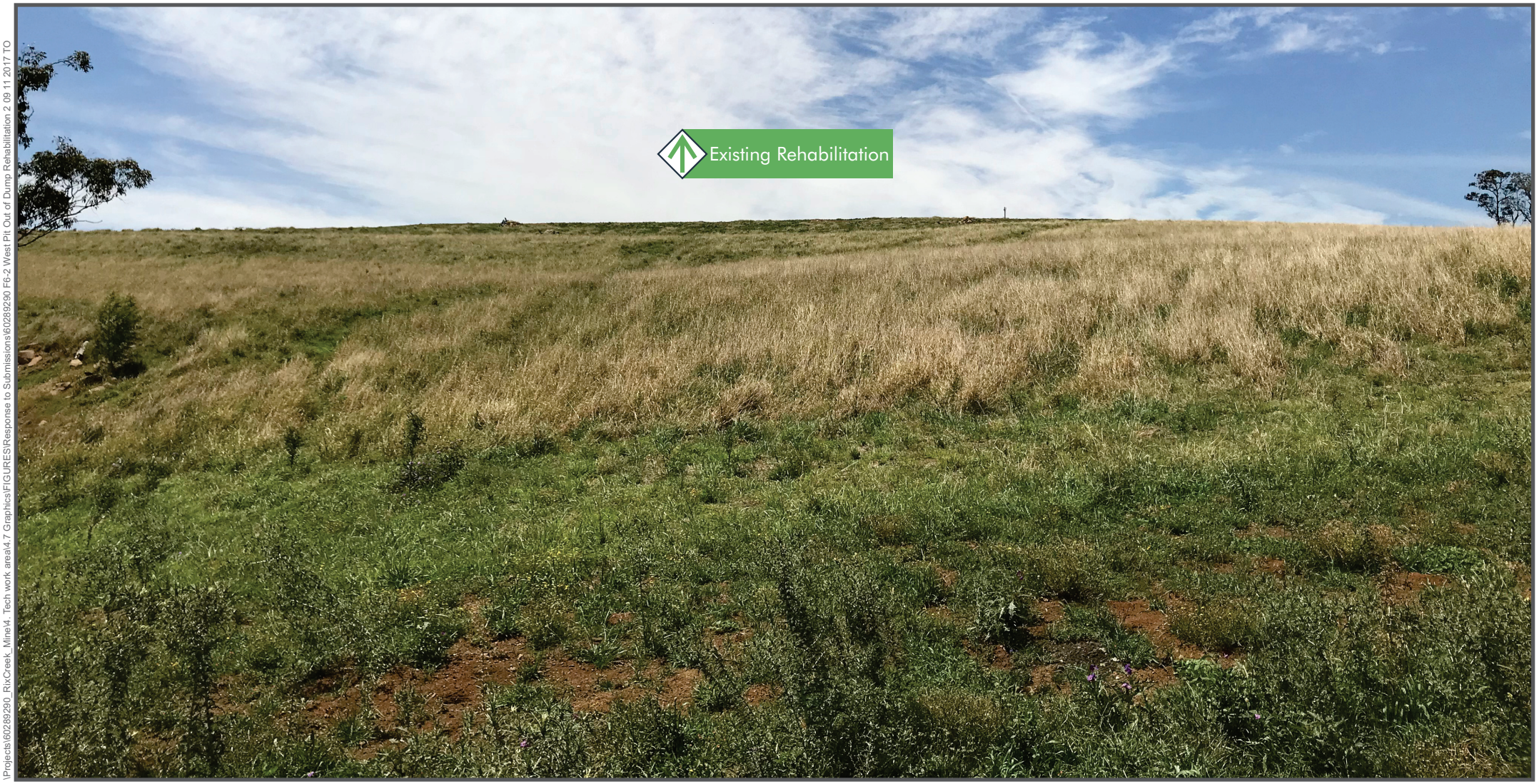
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WEST PIT REHABILITATION - NORTH 1

Rix's Creek Continuation of Mining
Response to Submissions

PLATE 6-1

\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions\60289290 F6-2 West Pit Out of Dump Rehabilitation 2 09 11 2017 TO



AECOM

WEST PIT REHABILITATION - NORTH 2

Rix's Creek Continuation of Mining
Response to Submissions

PLATE 6-2

\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions\60289290 F5-3 West Pit Out of Dump Rehabilitation 3 09 11 2017 TO



AECOM

WEST PIT REHABILITATION - SOUTH 1

Rix's Creek Continuation of Mining
Response to Submissions

PLATE 6-3



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AECOM

WEST PIT REHABILITATION - SOUTH 2

Rix's Creek Continuation of Mining
Response to Submissions

PLATE 6-4

\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions\60289290 F6-5 West Pit Out of Dump Rehabilitation 5 09 11 2017 TO



AECOM

WEST PIT REHABILITATION - SOUTH 3

Rix's Creek Continuation of Mining
Response to Submissions

PLATE 6-5

\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions\60289290 F6-6 West Pit Rehabilitation 09 11 2017 TO



AECOM

EXISTING WEST PIT REHABILITATION (MAISON DIEU VIEWPOINT)

Rix's Creek Continuation of Mining
Response to Submissions

PLATE 6-6

7.0 Response to Key Stakeholder and Community Submissions

7.1 Submissions in Support of the Project

7.1.1 Ongoing Employment, Local and Regional Economic Benefit, and Social Partnerships

Submission Identification: SIG05, SIG06, SIG09, SIG12, SIG15, SIG16, PS009, PS010, PS011, PS012, PS013, PS014, PS015, PS016, PS017, PS018, PS019, PS020, PS021, PS022, PS023, PS024, PS025, PS026, PS027, PS028, PS029, PS030, PS031, PS032, PS033, PS034, PS035, PS036, PS065, PS066, PS067, PS068, PS069, PS070, PS071, PS072, PS073, PS074, PS075, PS076, PS077, PS078, PS079, PS080, PS081, PS082, PS083, PS084, PS085, PS086, PS087, PS088, PS089, PS090, PS091, PS092, PS093, PS094, PS095, PS096, PS097, PS098, PS099, PS100, PS101, PS102, PS103, PS104, PS105, PS106, PS107, PS108, PS109, PS110, PS111, PS112, PS113, PS114, PS115.

Issue Description

Submissions were made relating to the benefits of the Project such as continued employment, ongoing contribution to the local and regional economy, continued social partnerships and support of local business and charities. Submissions also identified Bloomfield's commitment to minimising impact on the environment and to safe work practices. Many of these submissions highlighted the positive contribution that the Proponent makes to the local community and the fact that the Proponent is a local Australian owned business.

Response

This is noted.

7.2 Climate Change and Greenhouse Gases

7.2.1 GHG Emissions

Submission Identification: SIG02, SIG08, SIG10, SIG13, PS003, PS004, PS005, PS006, PS037, PS038, PS039, PS040, PS041, PS043, PS044, PS045, PS047, PS048, PS049, PS050, PS051, PS052, PS053, PS054, PS055, PS056, PS057, PS060, PS063.

Issue Description

Submissions relating to climate change, greenhouse gas (GHG) emissions associated with coal consumption and the need to embrace renewable energy instead of coal fired power generation.

Response

The EIS included a review of the GHG emissions that would be generated directly by Project activities, and indirectly through the use of the coal in metallurgical and thermal applications. The assessment found that the contribution of GHG to Australian and global emissions as a percentage of total emissions would be minor, and concluded that the Project would have a minor impact on climate change.

As noted in Section 23.4.4 of the EIS, climate change issues are unlikely to be resolved by dealing with individual projects. A project specific approach for a coal mine would mean that the coal would simply be sourced from another mine in another area.

Coal fired power generation and renewable energies are not incompatible. Coal fired power generation is likely to continue to play an important role in the energy market, even with increased use of renewable energy. Coal can provide baseload power, which is important to minimise disruption to the electricity market while transitioning to increased use of renewable energies.

Mitigation measures would be implemented to minimise GHG emissions, as described in the EIS. This would include preparation of a Greenhouse Gas and Energy Efficiency Management Plan, to include monitoring of fuel and electricity consumption, appropriate maintenance of plant and equipment, and development of targets for GHG emissions and energy use on site.

7.3 Air Quality

7.3.1 Dust Emissions / PM_{10} Emissions

Submission Identification: SIG02, SIG03, SIG04, SIG07, SIG08, SIG10, SIG11, SIG13, SIG14, PS002, PS007, PS008, PS038, PS039, PS041, PS042, PS043, PS045, PS046, PS047, PS048, PS051, PS052, PS058, PS059, PS061, PS063, PS064.

Issue Description

Submissions relating to dust emissions and specifically to the emissions of PM_{10}, including suggestion that the annual criteria of 20 µg/m^3 should be used to estimate impact.

Response

This issue has been addressed in detail in the response to the submission made by Hunter New England Population Health (refer to **Section 6.5.1** of this RRTS report).

7.4 Noise

7.4.1 Noise Levels from the Mine

Submission Identification: SIG02, SIG07, SIG08, PS002, PS007, PS008, PS038, PS041, PS042, PS045, PS046, PS058, PS059, PS061, PS064.

Issue Description

Submissions relating to noise impacts experienced by the local residential noise receivers.

Response

The EIS included an environmental Noise Assessment, which was summarised in Section 12.0 of the EIS and attached as Appendix M of the EIS. Results of the noise assessment indicated that exceedance of Project Specific Noise Criteria is likely during adverse meteorological conditions, but are predicted to significantly reduce as the Project progresses. The assessment considered 181 surrounding receptors and applied a worst-case scenario for both meteorological conditions and noise generation from the Mine. Noise modelling was undertaken to account for cumulative sources, including from surrounding mines and transport noise sources. Noise predictions captured this cumulative data and based on the anticipated noise level, solutions were identified that can be implemented to reduce operational noise levels at affected receptors. Importantly the use of a predictive noise model to identify the time of potential noise enhancement allows operations to minimise noise impacts at receivers. Real time insitu noise measuring is used to confirm compliance and to calibrate the model on an ongoing basis. With implementation of a range of feasible and reasonable mitigation measures, it was demonstrated that the recommended noise criteria would be met.

Additional modelling was undertaken as part of this RRTS Report to improve the accuracy of noise contours for areas north of Singleton. Further information is provided below.

Noise Criteria

As detailed in the environmental Noise Assessment the proposed Project noise criteria are:

- LAeq,15minute 40 dB for Noise Assessment Groups D to O inclusive, applicable to all time periods; and
- LAeq,15minute 42 dB for Noise Assessment Groups A, B and C, applicable to all time periods.

It is noted that these criteria are higher than the Project Specific Noise Levels (PSNL) detailed in the Project environmental Noise Assessment. As detailed in **Appendix J** the calculation of noise criteria was undertaken in accordance with the INP. The intent of the INP is to use the PSNL as a planning tool and trigger for establishing reasonable and feasible noise controls. Therefore compliance with PSNL is not necessarily required but used as a basis for establishing appropriate noise criteria. This is particularly applicable to an operation such at this Mine which is a long established operation that can be considered part of the normal acoustic environment.

The Noise Assessment indicated that the Mine would be unlikely to comply with PSNL during enhancing meteorological conditions at all receiver locations, with enhancing meteorological conditions generally only adversely impacting downwind receivers during such conditions. Therefore the Mine sought to use the PSNL having then implemented reasonable and feasible mitigation measures to then arrive at achievable noise criteria limit.

As outlined in Section 10 of the INP and detailed in **Appendix J,**, negotiation of achievable noise levels for existing operations may occur once reasonable and feasible noise mitigation options have been investigated. All reasonable and feasible noise controls were evaluated in the Noise Assessment, and noise controls and management strategies proposed for the Project are in line with industry best practice.

The Mine has historically operated standard (unattenuated) equipment, and an open sided wash plant (no cladding). With these noise mitigation measures in place and in unison with the predictive noise model, a reasonable and feasible level of noise management is proposed against an appropriate set of noise criteria. It is considered that local receivers would not be exposed to significant levels of noise impact.

Comparison of Existing and Proposed Noise Criteria

The current approval for Rix's Creek Mine (DA 49/94) defines specific noise criteria for areas surrounding the operations known as the Retreat, Singleton Heights and Maison Dieu. These criteria have been set as Noise Level Design Goals only and include criteria for both daytime and night time periods. DA 49/94 pre dates the introduction of the Industrial Noise Policy and refers to a noise descriptor LA10. The LA10 noise descriptor is a measure of the noise level which is exceeded for 10% of the specified period.

Use of the LA10 descriptor was superseded in January 2000 by the Industrial Noise Policy which requires noise assessment by measure of LAeq. LAeq is a measure of noise energy and can be mathematically manipulated, while LA10 is a statistical descriptor which cannot be accurately added to or subtracted from other LA10 measures or other descriptors. It is noted in the Noise Guide for Local Government (EPA, 2013), typically LA10 is about 3 dB(A) above the LAeq.

As part of the Continuation of Mining Project Bloomfield propose modified intrusive noise criteria to that within DA 49/94. Bloomfield propose intrusive noise criteria be applied to the Project as LAeq,15minute 40 dB for Noise Assessment Group (NAG) D to O inclusive, applicable to all time periods; and LAeq,15minute 42 dB for NAG A, B and C, applicable to all time periods.

In order to provide explanation to the proposed intrusive noise criteria the following is noted.

- Noise Assessment Groups A-C represent the area known as The Retreat. Night time Noise criteria under the current DA 49/94 is 40dB LA10. This 40 dB LA10 level equates to an LAeq (15 Minute) level of 43 dB. The proposed noise level for noise groups A-C is 42 dB LAeq (15 Minute) for all time periods. This is effectively 1 dB lower than the current project approval noise design goals;
- Noise Assessment Groups D-F represent the area known as Singleton Heights. Night time Noise criteria under the current DA 49/94 is 40dB LA10. This 40 dB LA10 level equates to an LAeq (15 Minute) level of 43 dB. The proposed noise level for noise groups D-F is 40 dB LAeq (15 Minute) for all time periods. This is effectively 3 dB lower than the current project approval noise design goals; and
- Noise Assessment Groups G-K represent the area known as Maison Dieu. Night time noise criteria under the current DA 49/94 is 38dB LA10. This 38 dB LA10 level equates to an LAeq (15 Minute) level of 41 dB. The proposed noise level for noise groups G-K is 40 dB LAeq (15 Minute) for all time periods. This is effectively 1 dB lower than the current project approval noise design goals.

Overall the intrusive noise criteria which is proposed to be applied to the Continuation of Mining Project is a reduction to the currently approved noise design goals contained within the current approval (DA 49/94). It should be noted that the NSW EPA has already adopted the above noise criteria for Rix's Creek Mine operations and has modified Environmental Protection Licence 3391 to

include these criteria. At the time of writing this RRTS document the Mine has had no exceedances of the newly applied EPL noise criteria.

Noise Implications of Integra Open Cut Purchase.

Since the exhibition of the EIS Bloomfield has purchased the Integra Mine as detailed in **Section 2.0** of this RRTS. As a result of this purchase ten fully attenuated Caterpillar 789 rear dump trucks and one fully attenuated Caterpillar 994 loader has been included in the Mine fleet. This allows the coal fleet to be fully noise attenuated, including the front end loader used to load the truck fleet with overburden or ROM coal. Only five coal trucks are typically in operation at one time and the remaining attenuated Caterpillar 789 trucks can be used for overburden haulage in critical areas during enhancing meteorological conditions.

A Caterpillar 992K loader has been moved from the Bloomfield site to replace an older Caterpillar 992C loader, and is currently in use on the Mine ROM coal pad. These actions effectively result in earlier implementation of key noise control measures, which allows the Mine to operate for longer periods during enhancing meteorological conditions before modifications to operations are required.

Bloomfield is committed to phasing in the attenuated equipment fleet, which combined with the cladding to the critical sides of the wash plant would improve the acoustic environment for sensitive receivers. When combined with the predictive noise model which allows mine managers to adjust operations if noise criteria are being approached, there is considered to be an appropriate level of noise control proposed for the Project.

7.5 Blasting

7.5.1 Blast Management and Blast Plumes

Submission Identification: SIG03, SIG14, PS002, PS008, PS046, PS059, PS061.

Issue Description

Submission related to blast plumes from incomplete reactions in Ammonium Nitrate and Fuel Oil (ANFO) blasts, and the potential for these blast plumes to travel distances from the mine site rather than disperse. Submissions also suggested that blasting be undertaken using plastic stemming plugs to prevent the release of blast emissions to the atmosphere.

Response

The potential for adverse impacts as a result of blast fume emissions was assessed in Section 11.4 of the EIS. The assessment identified that blasts occurring between 9.00am and 3.00pm pose little potential for adverse blast fume impacts to occur, while during the hours of 4.00pm to 5.00pm there is potential for adverse blast fume impacts beyond the site boundary under certain meteorological conditions.

As detailed in the EIS, the Mine currently operates in accordance with a Blast Fume Management Strategy. This includes use of a predictive blast management tool based on forecast weather data to determine if the upcoming conditions are suitable for blasting. These blast management tools indicate the potential extent of any impact at various times during the upcoming day, and allow the operator to select the best time of the day at which to schedule the blast. Through the ongoing operation of this system over the life of the Project, adverse impacts as a result of blasting are considered unlikely, or in the event that they do occur, minor.

The Blast Fume Management Strategy lists the potential controls to be used for blast fume mitigation, the majority of which are to ensure any moisture in blast holes is kept separate from any non- water resistant explosives. The Strategy also details the procedure for rating and recording post blast fumes, using the Visual NOx Fume Rating Scale. All blasts are video recorded and where a risk of post blast fume is identified, the blast is reviewed. In the event that a blast fume is rated as a minimum of three at its highest extent as it leaves the site, DP&E is notified and an investigation is undertaken. Outcomes of such investigation may lead to operational changes to prevent a reoccurrence.

It is also noted that the assessment of potential vibration impacts from blasting on sensitive receivers included blasting from the North Pit. It should be clarified that blasting in the North Pit is now complete and would not be required as part of the current Project. This was included in the assessment to

provide a conservative, worst case scenario, as the North Pit is located closer to the village of Camberwell. It is also clarified that the ground vibration criteria at the Rix's Creek Coke Ovens would continue to be 5 mm/s for 100% of blasts.

7.5.2 Clarifications Requested Outside of the Exhibition Period

Issue Description

Following review of the information in the EIS and original Response to Submissions Report, DP&E requested confirmation that blasting in the north pit has been completed.

Response

Bloomfield confirms that blasting activities in the north pit have been completed.

Issue Description

DP&E also requested additional information on predicted ground vibration levels at the Wright and Dunn receivers for blasting in the West Pit.

Response

It is noted that this information was contained within Appendix 1 of the Terrock Consulting report *Effects of Blasting in the Continuation Area*, however Table 4A of that report has also been updated to show the maximum predicted peak particle velocity (PPV) levels at the Wright and Dunn residences. The full report is provided at **Appendix K** and the relevant results are summarised in **Table 7-1**.

Table 7-1 Highest PPV Levels at Ernst, Retreat, M.R.S. Monitors, Wright and Dunn

Monitor	North Pit (charge mass = 1000 kg)			West Pit (charge mass = 1500 kg)				
	Ernst	Retreat	MRS	Ernst	Retreat	MRS	Wright	Dunn
Minimum Distance (m)	3190	4500	4885	4420	2690	3460	2350	2350
PPV Level at Min Dist (mm/s)	0.15	0.18	0.11	0.119	0.56	0.64	3.4	2.8

7.6 Traffic and Transport

7.6.1 Congested Rail Network

Submission Identification: SIG10, PS039, PS051, PS052, PS063.

Issue Description

Submissions relating to the congestion of the rail network and the impacts on passenger rail services, and the damage to the tracks caused by coal trains.

Response

The potential impact of the Project on the existing rail network was assessed in Section 18.0 of the EIS. An assessment of the existing and potential rail traffic generation was made against the capacity in the rail network, and consultation with ARTC was undertaken to assess the ability of the rail network to absorb the forecast change.

The Traffic Assessment undertaken as part of the EIS assessed the impacts of the Project on rail network capacity. Based on the mining schedule proposed in the EIS, train movements would remain relatively constant until around 2023. At this point it was predicted that the Bloomfield Mine in East Maitland would close and production at the Mine would increase. For an approximate three year period, rail traffic was predicted to increase by approximately 115 trains per year, or one additional train every three days. From 2025 it is expected that coal production would taper off and the rail traffic generated by the Project would gradually reduce. It is noted that the mine schedule has now been amended, as described in **Section 2.2.2** of this RRTS Report. The amendments would reduce the number of trains required during the peak years of the Project, and it is considered the assessment in the EIS represents a conservative estimate.

ARTC has advised that the required train paths would be available during the peak period to transport coal to Newcastle. Further confirmation of this was obtained in writing from ARTC following the exhibition of the EIS. A copy of this correspondence is attached at **Appendix L.** It was also noted that rail network access analysis undertaken by ARTC also makes provision for passenger trains, although these account for a small portion of rail traffic. As per its contractual requirements, the Mine would continue to provide ARTC with forecast tonnages for rail transport planning purposes and would consult with ARTC regarding required upgrades (if any) necessary to accommodate the anticipated rail traffic.

7.6.2 Covering of Coal Wagons

Submission Identification: SIG10, SIG13, PS039, PS043, PS047, PS048, PS051, PS052, PS063

Issue Description

Submissions relating to pollution caused by coal transport, covering of coal wagons and requests for improved rail transport practices.

Response

Section 11.0 of the EIS summarised the Air Quality Impact Assessment undertaken for the Project, which included an assessment of the potential Project related coal dust emissions from train wagons. Model predictions indicated that at distances of 50m and beyond from the centre of the rail track, the predicted maximum 24-hour average PM_{10} concentration for rural areas would be approximately 0.64 $\mu g/m^3$, and for urban areas would be approximately 0.4 $\mu g/m^3$. This is well below the assessment criteria of 50 $\mu g/m^3$. The assessment concluded that the potential for adverse air quality impacts associated with coal dust generated during rail transport would be low and would make negligible difference to air quality. It is also noted that coal is washed prior to transport reducing fine material within the product coal that has the potential to generate dust. This analysis and results are consistent with *Coal Train Dust Management: Hunter Valley Coal Industry* (NSW Minerals Council, March 2016) report.

As noted in Section 11.3.5 of the EIS, the Mine currently operates in accordance with a number of management plans to minimise and manage air quality impacts. This includes dust mitigation measures related to rail operations such as:

- Streamlined and consistent profiled coal surface within rail wagons;
- Train loading techniques and levels aimed at minimising spillage; and
- Collecting any spillage on a regular basis.

7.7 Biodiversity

7.7.1 Loss of Habitat and Biodiversity Offset Areas not Identified in EIS

Submission Identification: SIG02, SIG07, SIG08, SIG10, SIG11, PS007, PS038, PS039, PS041, PS048, PS051, PS052, PS058, PS059, PS061, PS063, PS064

Issue Description

Submissions relating to the impact to biodiversity caused by loss of habitat due to mine expansion, particularly the impact to the Central Hunter Valley Eucalypt Forest and Woodland critically endangered ecological community, and the lack of detail regarding biodiversity offset areas provided in the EIS.

Response

Potential impacts of the Project on biodiversity were assessed in the Ecological Assessment (Appendix I of the EIS) and addressed in Section 13.0 of the EIS. This included assessment of the potential impact to the Central Hunter Valley Eucalypt Forest and Woodland. Additional information regarding the mapping of this vegetation community is provided in **Section 6.7.1**.

The process regarding biodiversity offsets for the Project was discussed in Sections 13.1.1, 13.1.2, 13.4.6 and 13.5.1 of the EIS. This information has been updated by the additional biodiversity assessment and offset calculations summarised in **Section 3.2** and provided in **Appendix B.** As noted

in this information, Bloomfield has sought to minimise biodiversity impacts where possible**.** A Range of site management and mitigation measures have also been developed including site rehabilitation and returning appropriate areas to native vegetation cover.

Where clearing of native vegetation communities cannot be avoided Bloomfield has undertaken additional assessment to determine appropriate levels of offsetting are provided. As detailed in **Section 3.2** Bloomfield originally intended to offset the Project biodiversity impacts under the offsetting requirements of the Upper Hunter Strategic Assessment (UHSA). Due to uncertainties regarding the potential for the UHSA to be finalised prior to the start of the Project, Bloomfield has also calculated what offsetting would be required in accordance with the methodology provided under the *Framework for Biodiversity Assessment* (FBA) (OEH, 2014). Subject to approval Bloomfield is committed to offsetting the biodiversity impacts of the Project under the most appropriate offsetting scheme in place at the time of approval. Section 5 of **Appendix B** includes an offsetting strategy that has been prepared to identify how offsets could be provided to suitably offset the Project. This includes:

- Identifying if suitable credits are available on the market to meet offset requirements;
- Finding potential on-site or off-site offset sites with the biodiversity values required to compensate for the project's impacts;
- In the absence of suitable offset credits or properties, applying the variation criteria rules of the FBA and finding suitable offsets to meet the requirements; and
- Payment into the Biodiversity Conservation Trust.

Reference is made to **Appendix B** for the full details of the proposed offsetting strategy.

7.7.2 Squirrel Glider

Submission Identification: SIG10, PS008, PS038, PS039, PS048, PS051, PS052, PS059, PS061, PS063

Issue Description

Submissions relating to the impact to the Squirrel Glider and suggestions that this impact has not been adequately assessed.

Response

Potential impacts of the Project on fauna, including the Squirrel Glider, were assessed in the Ecological Assessment (Appendix I of the EIS) and addressed in Section 13.4.3 of the EIS. The Ecological Assessment included a significance assessment (Seven-Part test) of the Squirrel Glider. While it was identified that the Project may have the potential to disrupt the life cycle of the Squirrel Glider and its habitat through loss of foraging resources and hollow-bearing trees, the impacts were not considered to significantly affect the local population to the degree that its long term viability would be reduced.

The vegetation within the Project Area is highly fragmented; however suitable connectivity exists to adjoining remnant vegetation. A large corridor of regrowth forest between the western and central patch within the Project Area would be maintained. This corridor supports higher quality habitat compared to the habitat proposed to be cleared in the western and central patches which is rated low owing to the very low diversity of tree species and the absence of understorey vegetation. Habitat quality is considered higher in the eastern patch but there is a low density of mature trees to provide breeding and sheltering habitat.

It was noted that the staging of the mining process would allow for the gradual dispersal of wildlife into surrounding lands, and consequently it was considered that the cumulative impacts on wildlife would be negligible. During clearing of vegetation as part of the operational phase of the Project, there would be potential for displacement of individuals of the Squirrel Glider population. The EIS outlined the mitigation measures that would be implemented to minimise the potential impacts on the Squirrel Glider, which include:

- Mine planning would avoid the removal of vegetation and habitat where reasonable and feasible;

- Vegetation and habitat would only be removed in a staged manner with the inspection of habitat trees carried out before and during felling operations;
- Significant ecological features associated with standing and dead timber would be assessed and monitored. A qualified and experienced fauna consultant would conduct pre-clearance surveys to ensure displaced wildlife is removed or relocated at the time of clearing; and
- Inspection of hollows would be undertaken by a qualified fauna ecologist prior to and immediately after tree felling. Felled trees supporting hollows would be stockpiled for later use in rehabilitation activities to reinstate habitat where suitable and in accordance with the Project Rehabilitation Strategy.

7.8 Land Capability and Land use

7.8.1 Loss of Arable Land

Submission Identification: SIG02

Issue Description

Submissions relating to the loss of arable land due to mine expansion.

Response

Section 14.0 of the EIS discussed the potential impacts of the Project in relation to soils, land capability and land use. Land within the Project Area has traditionally been used for grazing. Cattle grazing enterprises have been conducted on the land by various members of the Bowman family since 1890. There is no record of any cropping being conducted on the land.

The soils and land capability of the land within the Project Area were identified as Classes 4 and 5 with moderate to low agricultural capability. It was also noted that the sections of the site that would be subject to disturbance are not currently used for significant productive agricultural purposes. As a result, the Project would not be removing any significant agricultural production from the local economy.

Existing rehabilitation and revegetation practices at the Mine are intended to return disturbed land to a condition suitable for a range of post mining land uses including the reinstatement of pre mining agricultural land use where appropriate. The EIS provides a detailed description of the rehabilitation activities proposed for the Project (Section 25.0 of the EIS). Rehabilitation of the Project Area following mining would return an appropriate mix of land uses, with those areas marked for future grazing to be rehabilitated back to a mix of Class 4 and 5 land capabilities consistent with the pre-mining land capability of the site and region.

As noted in Table 29-1 of the EIS, the existing Rehabilitation Management Plan would be reviewed and updated to include areas to be disturbed and rehabilitated as part of the Project. This includes the rehabilitation of proposed agricultural areas to establish ecosystems for grazing.

Following the identification of the New Disturbance Area, the same agricultural consultant undertook additional assessment of the portion of that area not previously assessed. A copy of the revised AIS report is attached at **Appendix D** and the results summarised in **Section 3.3**.

7.9 Proposed Rezoning of Land North of Singleton to Residential Land use

Submission Identification: PS062

This submission relates to an existing Planning Proposal to rezone Lots 32 and 33 DP634692, No 349 Bridgman Road, north of Singleton Heights, to enable the use of the land for residential purposes. The submission relates to a number of issues regarding the future use of the land for residential purposes, specifically with regard to dust, noise and vibration impacts from the Project.

7.9.1 Noise

Issue Description

The submission makes the following objections:

1. Future use of the subject lots as residential land has not been considered;
2. The western part of the subject lots are not included within any Noise Assessment Group (NAG); and
3. The submission seeks assurance that the proposed expansion of the mine and continued operation would not result in unlawful noise impacts on the subject lots.

Response

1. Whilst not specifically included in the original vacant land assessment, the subject lots were included in the acoustic assessment by generating noise contours over the lot areas. This approach is standard practice for assessing vacant areas, as there are not currently individual residences to predict noise levels. To improve the accuracy of the noise contours in the area, the models have been reprocessed with a higher density of receiver points over the subject lots. Updated noise contours over the subject lots and an assessment against Voluntary Land Acquisition and Mitigation Policy criteria are included in **Appendix J**;
2. Noise assessment groups (NAGs) were developed to categorise existing private residential receptors into groups with a similar acoustic environment. The eastern extent of the subject lots were allocated to NAG B due to proximity to the Main North Rail Line and Mine CHPP, and, the similarity of the existing acoustic environment to the background noise logging location approximately 900 metres north of the subject lots. Noise from the Main North Rail Line is often be considerably higher than the proposed criteria for the Project. With consideration of the proposed residential development, the western extent of the NAG B boundary should be extended west to the Main North Rail Line. The subject lots and the vacant land immediately south would be incorporated into NAG B. Notably a key component of the revised Project is the commitment by Bloomfield to surrender its development consent for the Rix's Creek Mine Rail Loop which would eliminate this as a noise source; and
3. If approval of the Project is granted, a development consent would be issued by DP&E, and a licence would be issued by the EPA and conditions typically set with due consideration of the EIS. This ensures all reasonable and feasible noise mitigation measures are considered and implemented. The Proponent is committed to managing noise emission from the Mine to comply with all noise limits.

Issue Description

The submission also made a number of general comments in relation to the Mine's noise management and compliance with existing and proposed noise criteria.

Response

A detailed response to the noise related comments made in the submission is provided in **Appendix J** and briefly summarised here.

The submission states that the mine does not comply with current conditions of consent in relation to noise limits. However, a review by Global Acoustics of monthly attended compliance monitoring results over the past two years indicates no exceedance of current development consent criteria has occurred during that period.

The submission also states that the Mine seeks approval for a Project Specific Noise Goal which exceeds both the current conditions of consent and intrusiveness criteria under the INP. However it is noted that the current conditions of consent apply under neutral atmospheric conditions whereas proposed noise criteria for the Project would apply under enhanced atmospheric conditions.

The following general points are made in response to the submission:

- With consideration of meteorological effects, and adjustment between LA_{10} and L_{Aeq}, proposed criteria are more than 3 dB more stringent than those in the existing development consent;
- Model predictions indicate a reduction in noise levels over the life of the Project. Implementation of noise controls would further reduce noise emission from the site. A general improvement in offsite noise levels is predicted relative to both historic and current situations; and
- Mine operations continue to progress in a north-westerly direction away from Singleton, and away from the subject lots. Adoption of proposed criteria and implementation of noise mitigation and management strategies including the operation of the predictive noise model, would serve to reduce noise levels in the area of concern.

7.9.2 Stakeholder Consultation of Revised Project

During the preparation of the RRTS report revised specialists assessments where undertaken for noise and air quality, as described above to address how the Project may impact on the Singleton Height's Planning Proposal. For reference these updated reports were subsequently provided to Singleton Council (which provided them to the proponent), the EPA and the Department of Primary Industries - Resource & Energy. Copies were also provided to DP&E's Newcastle Regional Office which is undertaking the merit assessment of the Planning Proposal.

7.9.3 Air Quality

Issue Description

The submission requested confirmation that there would be no adverse dust impacts on the subject lots, given that the proposed expansion of Pit 3 is located west of the New England Highway approximately 2.5km from the subject lots.

Response

Air quality impacts were assessed in Section 11 of the EIS, and in the AQIA attached as Appendix L of the EIS. Dispersion modelling was undertaken for each of the mine plan years of 2017, 2020, 2023 and 2026 to assess the potential impact of the Project at privately owned and mine owned sensitive receptor locations. Results are provided in Table 9-1 of the AQIA, and in isopleth diagrams presented in Appendix E of the AQIA. While vacant land was not specifically included as a sensitive receptor, the subject lots were included in the assessment by generating contours of predicted dust concentrations over the area.

The EIS also included a number of figures showing the modelled worst case scenarios for all years for maximum 24 hour average PM_{10}, annual average $PM_{2.5}$, annual average PM_{10}, annual average total suspended solids, and annual average dust deposition. For the area covering the subject land, these predicted concentrations are shown in Figures 11-6, 11-8, 11-10, 11-12 and 11-14 of the EIS respectively. Review of these figures indicates that predicted concentrations of the air quality parameters at the subject land would be within air quality criteria.

It is also noted that under the proposed mine plan, mining activities would move away to the north-west as mining progresses, which would increase the distance of mining activities from the subject land. Consequently this would decrease the potential impacts on the subject land over time as mining progresses to the north-west.

In addition, with the proposed reduction in mining during the previously proposed peak years (Refer **Section 2.0**) overall air quality impacts are expected to reduce by approximately 18%. This has been described earlier in **Section 6.4** with modelling results provided in **Appendix H.**

7.10 Surface Water

7.10.1 Impact to Surface Water, Water Consumption and Contamination

Submission Identification: SIG02, SIG07, SIG08, SIG10, PS001, PS002, PS039, PS041, PS042, PS046, PS048, PS051, PS052, PS058, PS059, PS061, PS063, PS064

Issue Description

Submissions concerned that impacts to surface water have not been adequately assessed, that sediment dams may overflow after strong rainfall leading to unsuitable surface water entering local waterways, and that cattle utilising the Deadman's Creek catchment may be impacted. One submission requested a timetable for the proposed increase in size of pre-existing sediment dams and requested that the new sediment dams be constructed prior to commencement of mining in those areas.

Response

Potential impacts to surface water as a result of the Project were assessed in the Surface Water Impact Assessment (Appendix R of the EIS) and addressed in Section 15.0 of the EIS. Additional information regarding potential flooding impacts has been prepared as part of this RRTS. The results of the Flooding Report are discussed in **Section 6.7.5** of this RRTS Report, and the full report is provided at **Appendix I**. Additionally, a specific response has been prepared by JP Environmental, to address two of the community submissions received by neighbouring landowners regarding surface water issues. The JP Environmental response is attached as **Appendix M** and is summarised below.

The response by JP Environmental included an assessment of the potential for dam overflows, water quality testing results from monitoring of sediment dams at West Pit and Deadman's Creek since 2011, the potential for clay toxicology and impacts to livestock from runoff in Deadman's Creek catchment, and provision of a sediment dam construction schedule.

Review of the dam capacity and the 2015 daily rainfall record suggests that there was potential for three or four overflow events in 2015, which is consistent with the observations of the neighbouring landowner. For the current Project, as noted in the EIS, sediment dams would be dewatered within five days of a runoff event. Where the water exceeds water quality objectives, the water would either be treated, pumped to another water storage with available capacity, or pumped into the mine water management system. Where water quality objectives are met, the water may be release to receiving waters.

Water quality results indicate that the runoff collected in dams from mined and un-mined catchments can contain appreciable levels of sediment (that is, greater than 50 mg/l). Based on review of aerial photographs from 2013 - 2015, most dams in the Deadman's Creek catchment are turbid, reflecting the nature of the catchment soils and variable runoff across the catchment rather than any specific activity in the catchment. The average value of suspended solids from sampling in Deadman's Creek catchment was lower in 2015 (65 mg/l) when overburden placement commenced, compared to 2011 – 2014 (95 mg/l).

The majority of soils and sub-surface materials in the upper reaches of Deadman's Gully are highly erodible soils containing substantial amounts of colloidal material – clays and fine silts. High turbidity due to colloidal material can make water appear very murky and degraded and is the most likely cause of the land owners concerns about poor water quality.

The trigger level for dissolved aluminium for stock water is set at 5 mg/l in the *Australian and New Zealand Environment and Conservation Council (ANZECC) Guidelines for Fresh and Marine Water Quality 2000* (ANZECC 2000). Aluminium levels from water quality monitoring in the Deadman's Creek catchment and at West Pit normally range between 1 and 5 mg/l, which is acceptable for stock water. A Trigger Action Response Plan (TARP) for the site is in place which includes measures for ongoing monitoring of runoff and seepage waters in the event that data obtained from the compliance monitoring program indicates exceedance.

On balance, ingestion of suspended clays by cattle from mine sediment dam overflows was considered to pose little or no risk to the livestock. Comparable water quality conditions exist on adjacent farm lands and water quality results generally indicate acceptable levels of heavy metals and other toxicants with respect to ANZECC 200 stock trigger levels.

Sediment dams can be constructed to treat runoff from the immediate catchment that is affected, or to manage the whole of the catchment, including clean and previously rehabilitated areas. For the current Project, a whole of catchment approach was adopted in the EIS. Based on the EIS mine plans, the required sizes and timing of construction of sediment dams 6 & 7, 16 and 17 is set out in **Table 7-2** to **Table 7-4**. Sediment Dam 20 was not considered in these tables as it is a relatively small dam (4ML) when compared with the other dams.

Table 7-2 Sediment Dams 6 & 7

Catchment	2017	2020	2023	2026
Clean Catchment area (ha)	1.3	1.3	1.3	1.3
Mature Rehabilitation area (ha)	0	29.03	49.05	64.05
Disturbed Catchment area (ha)	15.01	14.1	15	0
Total Area (ha)	**16.31**	**44.43**	**65.35**	**65.35**
Required Volume (ML)	**3.5**	**13**	**16**	**0**

Table 7-3 Sediment Dam 16

Catchment	2017	2020	2023	2026
Clean Catchment area (ha)	51.51	51.51	12.23	12.23
Mature Rehabilitation area (ha)	0	0	21.27	35.67
Disturbed Catchment area (ha)	0	13.45	14.4	15.46
Total Area (ha)	**51.51**	**64.96**	**47.9**	**63.36**
Required Volume (ML)	**0**	**12**	**11**	**15**

Table 7-4 Sediment Dam 17

Catchment	2017	2020	2023	2026
Clean Catchment area (ha)	33.3	33.3	1.5	1.5
Mature Rehabilitation area (ha)	0	27.1	18.4	43.2
Disturbed Catchment area (ha)	27.1	0	0	24.5
Total Area (ha)	**60.4**	**60.4**	**19.9**	**69.2**
Required Volume (ML)	**16.3**	**0**	**8**	**17**

In response to the landowners concerns, JP Environmental concluded that:

- The sediment dams on site should be (and are) designed in accordance with the requirements of the *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) (Blue Book).The existing dams appear to be responding to flooding/rainfall in a manner consistent with Blue Book designs;
- Sediment dams designed and operated in accordance with the Blue Book should pose little risk to the aquatic and environmental values of the Hunter River;
- A timetable of required sediment capacity for "whole of catchment" dams has been provided. It is also possible for smaller dams to be installed to manage only the recently disturbed areas and

comply with the Blue Book requirements. The final dam size and locations may not be consistent with **Table 7-2** to **Table 7-4** above, but still meet the requirements of the Blue Book;

- On balance, ingestion of suspended clays in water by cattle, poses little or no health risk. Comparable conditions exist on adjacent farm lands. The main clay minerals appear to be non-toxic to humans, and, mainly by extension, animals. Clay adsorption pathways for toxicants and biological contamination are less well understood but this risk is believed to be low; and
- Additionally all dams on site are built to engineering design principles inclusive of dam wall and spillway.

Whilst the JP Environmental report concluded that aluminium levels in runoff water at West Pit and in Deadman's Creek catchment generally remain below ANZECC 2000 trigger levels for stock water use it also recommended that additional assessment should be undertaken to identify the source of the elevated aluminium levels and therefore determine if additional management measurers are required. Bloomfield engaged RPS to review historical water quality data as collected from 2011 onwards from sediment dams (16, 17 and 20) within Deadman's Gully and from with the creek itself. A copy of RPS's historical data analysis and assessment is attached at **Appendix M.**

Based on the historical data review RPS made the following conclusions:

- The dissolved aluminium concentrations in all samples collected in Deadman's Creek catchment ranged from below detection limits (<0.01 mg/L) up to 1.1 mg/L at its highest, which is typical of dissolved aluminium concentrations in natural waters in a neutral pH range;
- These dissolved aluminium concentrations are well below the ANZECC health guideline value of 5 mg/L for long-term livestock water sources – which confirms that these water sources are considered safe and suitable for livestock consumption; and
- The initially reviewed aluminium concentrations represented Total Aluminium, and given that the pH range is neutral, (and in light of the dissolved aluminium results) it can be confirmed that the Total Aluminium concentrations are dominantly comprised of particulate matter (and a very minimal soluble aluminium component). Aluminium is a highly abundant element in the earth's surface, and is chemically stable in typical/neutral pH environments, typically complexing as alumino-silicates - a core component of clay materials.

Based on the analysis of the historical data it has been concluded that the chemically stable aluminium in clays and suspended solids in the water do not pose a toxicological danger to the environment, and on this basis, it is not anticipated that adverse health effects would occur for either humans or livestock. No additional management measures for managing risks associated with soluble aluminium are deemed necessary.

7.10.2 Clarifications Requested Outside of the Exhibition Period

DP&E requested additional information with regard to the surface water. Specifically DP&E requested additional information regarding expected changes to catchment surface areas over the life of the Project and a comparison of the catchment changes between the currently approved final land form and the final landform proposed by the Project.

JP Environmental prepared the surface water and hydrology technical assessment which formed Appendix R to the Project EIS. JP Environmental has subsequently undertaken additional work in response to DP&E requirements. JP Environmental response is attached at **Appendix M** and summarised below.

Issue Description

DP&E requested additional information regarding expected changes to catchment surface areas over the life of the Project and a comparison of the catchment changes between the currently approved final land form and the final landform proposed by the Project.

Response

The North Pit and South Pit final landforms are similar between the currently approved and proposed landform scenarios. The West Pit is the primary focus of the Project and is the primary Pit within the

Project Area that would differ in size between the approved and proposed scenarios. This is reflected in **Table 7-5.**

Table 7-5 Approved and Proposed Final Landform Areas

Location	Approved Landform Rehabilitation (ha)	Proposed Landform rehabilitation (ha)	Variance (%)
North Pit	379	457	+21
South Pit	109	101	-7
West Pit	127	438	+245
Voids	122	140	+15
Total	**737**	**1136**	**+54**

In regards to individual catchments within the Project Area the changes to the catchments areas are:

- Rix's Creek: 2,495 ha reduced by approximately 39 ha, or 1.5% less than currently approved;
- Station Creek: 2,466 ha increased by approximately 56 ha, or 2.3% more than currently approved;
- Deadmans Creek: 1,261 ha reduced by approximately 35 ha, or 2.5% less than currently approved; and
- The rehabilitated mine voids: 140 ha or approximately 15% more than currently approved.

A comparison of the West Pit between the approved and proposed Project is provided in

Table 7-6.

Table 7-6 Comparison of Final Catchment Areas

Scenario	Rix's Creek (ha)	Station Creek (ha)	Deadmans Creek (ha)	Mine Voids (ha)	Total (ha)	Catchment Loss (%)
Undisturbed (1990)	2,562	2,413	1,387	0	6,362	0
Approved Final Landform	2,534	2,410	1,296	122	6,362	1.9
Proposed Final Landform	2,475	2,466	1,261	140	6,362	2.2
Sub-Catchment Change (ha)	**-59**	**+56**	**-35**	**+18**	**0**	**0.3**

Overall it is considered that when comparing the approved final landform and the proposed final landform, the change in catchment areas would be of a magnitude that would result in changes to runoff, flooding and stream hydrology that are largely undetectable, therefore any impacts as a result of this change would be negligible. Additional commentary is provided in **Appendix M.**

7.11 Groundwater

7.11.1 Groundwater Disruption

Submission Identification: SIG02, SIG07, SIG08, SIG10, SIG11, PS039, PS041, PS046, PS048, PS051, PS052, PS058, PS059, PS061, PS063, PS064

Issue Description

Submissions concerned that impacts to groundwater have not been adequately assessed in the EIS.

Response

Potential impacts of the Project on groundwater were assessed in the Groundwater Impact Assessment (Appendix S of the EIS) and addressed in Section 16.0 of the EIS. Additional information regarding the hydrogeology of the Project Area and the groundwater modelling undertaken for the Project has been prepared as part of this RRTS. The additional information is discussed in **Section 6.1.2** of this RRTS Report, with full details provided at **Appendix G.**

7.12 Lighting

7.12.1 Impact as a Result of Night Lighting

Submission Identification: PS042, PS045

Issue Description

Submission relating to the need to control night lighting to minimise impacts (eg lights on machinery to be lowered to light along the ground or light ahead horizontally).

Response

Night lighting was considered as part of the assessment of landscape character and visual amenity (Section 21.0 of the EIS). As described in the EIS, and included in *Table 29-1 Summary of Management and Mitigation Measures*, night lighting would be controlled via a Visual and Landscape Management Plan which would include measures to address:

- Design and location of new lighting to avoid direct line of sight from areas surrounding the Mine where practicable; and
- Location of operational mobile lighting to minimise light spill where reasonable and feasible.

The Environmental Management System currently in place at the Mine includes details of actions to be taken to prevent night lighting impacts, in the event that a complaint is received regarding night lighting. A 24 hour complaints line is maintained to ensure timely response to night lighting incidents. As noted in Section 8.2.2 of the EIS, the existing Environmental Management System would continue to govern environmental management for the duration of the Project, and existing plans and procedures would be updated to reflect the Project and include the recommended management, mitigation and monitoring measures set out in the EIS.

7.13 Final Void and Landform

7.13.1 Final Void to be retained in the Post Mining Landscape

Submission Identification: SIG02, SIG07, SIG08, SIG10, SIG11, PS039, PS046, PS048, PS051, PS052, PS059, PS061, PS063, PS064.

Issue Description

Submissions objecting to a final void in the post mining landscape, and requesting additional detail regarding the rehabilitation and management of the final void in the long term.

Response

Alternatives considered during the Project planning included a larger final void than currently proposed. As discussed in Section 5.5 of the EIS, the final landform design for the Project has been derived following consultation with relevant government regulators. During this consultation some issues with the original design of the final landform were identified, including the inclusion of a stable mine highwall adjacent to the New England Highway, to be utilised as the access point to the remaining underground resource. This presented a risk of inappropriate public access to the highwall and associated safety concerns. A Mining Options Strategy Review was undertaken (Appendix D of the EIS) to redesign the mining sequence to allow for:

- Highwall access to the underground resource in an area safe from public access;
- A geotechnically stable mine pit shell with particular reference to the New England Highway;
- A final landform containing no highwalls, with the maximum slope of rehabilitated landform to be limited to 18 degrees;
- A final landform that allowed for no increase in existing maximum rehabilitated landform heights and a continued westerly movement of the mining area. This was essential for control of noise, air quality and visual amenity impacts;
- Micro / macro relief or small scale elevation and topographic variations would be designed into the continuing rehabilitated landforms to replicate natural landscapes and habitat; and
- A Mine Operations Plan which maximised the recovery of the remaining open cut resource from within the development consent area.

The final landform included in the EIS (identified as option 5 in the Mining Options Strategy Review) which was designed in consultation with DRG includes:

- This application does not include the access portal to the potential underground resource which would be subject to a separate development consent. The depression after completion of open cut mining would be a clean water storage area;
- A final depression to the west of the New England Highway. This fully rehabilitated landform would contain a maximum grade of 18 degrees to enable agricultural equipment to safely work on it to establish the pasture and treed ground cover as well as presenting no safety access issues for the general public. A surface water diversion drain would be established to ensure maximum recovery of surface water flows into Rix's Creek. Below this diversion drain there would be 140 hectares of rehabilitated landform that would act as a water sink and not connect to external drainage lines. The groundwater study has calculated groundwater in the void would reach equilibrium over the long term at a level that creates a 80 hectare water body and 60 hectares of remaining rehabilitated land;
- Sacrificing 1.4 million tonnes of saleable coal to ensure the long term stability of the northern end of the depression and recovery of 28.5 million tonnes of saleable coal from the remaining open cut resource; and
- Substantially improved visual amenity. All landforms on the eastern side of the New England Highway would be fully rehabilitated and return all surface water runoff to Rix's Creek. The mining depression on the western side of the New England Highway is fully rehabilitated and not visible from the highway.

Section 25.6.7 of the EIS discusses issues relating to the final void, including the key planning considerations that have been incorporated into the design of the final void area. This includes creation of a final void of relatively low safety risk as the depression grades can be climbed safely by foot.

A Final Void Management Plan would be prepared for the Mine which includes predictive groundwater modelling to forecast the long-term impacts to local and regional groundwater flows, residual pit voids, spoil dump storage and long term salinity levels. The final void would be rehabilitated with vegetation species with a diversity that is appropriate for the surrounding landform. Specific issues that have been considered in the context of rehabilitation of the voids include:

- Salinity levels in the final void which result from the inflow of saline groundwater;
- Ecosystem health in the water body of the void;
- Selection of plant communities that can be developed and sustained on the batters of the void, which as the water levels rise would aid in the development of aquatic ecosystems; and
- Inclusion of appropriate measures to limit access to steeper areas around the final void to restrict cattle, pedestrian and vehicle access. These measures may include large rock placement, landform shaping, or fencing as agreed with relevant government agencies during closure planning.

As noted in the EIS, design alternatives for the final void would continually be evaluated and would be prepared as part of the closure planning process.

Figure 7-1 of this RRTS Report provides a comparison between the final voids currently approved in the 1995 development consent, and the final landform proposed in the current application. The comparison shows that the overall area of depression in both final landform designs is relatively similar. As detailed above, the proposed final landform is a result of the detailed mine planning undertaken by Bloomfield following the Planning Focus Meeting based on feedback from various agencies.

7.13.2 Clarifications Requested Outside of the Exhibition Period

Issue Description

DP&E requested clarification regarding the final landform, final void and visual impacts of this final landform.

Response

The Project has been designed to achieve maximum resource recovery, utilizing open cut mining methods, from within Coal Lease 352 and Mining Lease 1432. Section 6.10 (Mine Closure) of the EIS, outlines at completion of open cut extraction of the coal reserves, there would be a remaining resource of underground coal available.

The Project does not contemplate development of the underground resource. The proposal is to rehabilitate the landform to a pre-mining state. Any use of open cut voids to gain access to the underground resource or retention of existing surface infrastructure, to process the coal, would be the subject of a separate application or modification to the Project.

A Mining Options Strategy Review was undertaken (Appendix D of the EIS) to redesign the mining sequence to allow for:

- A geotechnically stable mine pit shell with particular reference to the New England Highway;
- A final landform containing no highwalls, with the maximum slope of rehabilitated landform to be limited to 18 degrees;
- A final landform that allowed for no increase in existing maximum rehabilitated landform heights and a continued westerly movement of the mining area. This was essential for control of noise, air quality and visual amenity impacts;
- Micro / macro-relief or small scale elevation and topographic variations would be designed into the continuing rehabilitated landforms to replicate natural landscapes and habitat; and
- A MOP which maximised the recovery of the remaining open cut resource from within the development consent area.

The final landform included in the EIS (identified as Option 5 in the Mining Options Strategy Review) was designed in consultation with DRG. Details are as follows:

- A final depression to the west of the New England Highway. This fully rehabilitated landform would contain a maximum grade of 18 degrees to enable agricultural equipment to safely work on it to establish the pasture and treed ground cover as well as presenting no safety access issues for the general public. A surface water diversion drain would be established to ensure maximum recovery of surface water flows into Rix's Creek. Below this diversion drain, there would be 140 hectares of rehabilitated landform that would act as a water sink and not connect to external drainage lines. The groundwater study has calculated the groundwater resource equalises in the long term at a level that creates a 80 hectare water body and 60 hectares of remaining rehabilitated land;
- The final landform at completion of mining in the area adjacent to the 1880's Ellsmere Colliery (north of the New England Highway) is designed to be rehabilitated to a 18 degree maximum slope surrounding a 17 hectare depression that is free draining into Rix's Creek. This depression would contain surface water runoff and be part of the upper tributaries of Rix's Creek; and
- All landforms on the eastern side of the New England Highway would be fully rehabilitated and return all surface water runoff to Rix's Creek, Station Creek and Deadman's Gully. The mining depression on the western side of the New England Highway would be fully rehabilitated and not visible from the highway. This would result in a substantially improved visual amenity.

Section 25.6.7 of the EIS discusses issues relating to the final void, including the key planning considerations that have been incorporated into the design of the final void area. This includes creation of a final void of relatively low safety risk as the depression grades can be climbed safely by foot.

A Final Void Management Plan would be prepared for the Mine which would further develop predictive groundwater modelling as a component of the *Groundwater Impact Assessment* (Appendix S of EIS). The final void would be rehabilitated with vegetation species with a diversity that is appropriate for the surrounding landform and land use. Specific issues that have been considered in the context of rehabilitation of the voids include:

- Salinity levels in the final void which result from the inflow of saline groundwater;
- Ecosystem health in the water body of the void;
- Selection of plant communities that can be developed and sustained on the batters of the void, which as the water levels rise would aid in the development of aquatic ecosystems; and
- Inclusion of appropriate measures to limit access to steeper areas around the final void to restrict cattle, pedestrian and vehicle access. These measures may include large rock placement, landform shaping, or fencing as agreed with relevant government agencies during closure planning.

As noted in the EIS, design alternatives for the final void would continually be evaluated and would be prepared as part of the closure planning process.

The original Response to Submissions Report provided a comparison between the final voids currently approved in the 1995 development consent, and the final landform proposed in the current application. The comparison shows that the overall area of depression in both final landform designs is relatively similar. However the Project would result in a reduction in voids from two to one, and would produce a more natural final landform with final heights representative of surrounding topography, a more natural landform with improved micro / macro relief and drainage channels more representative of local slope and meandering characteristics.

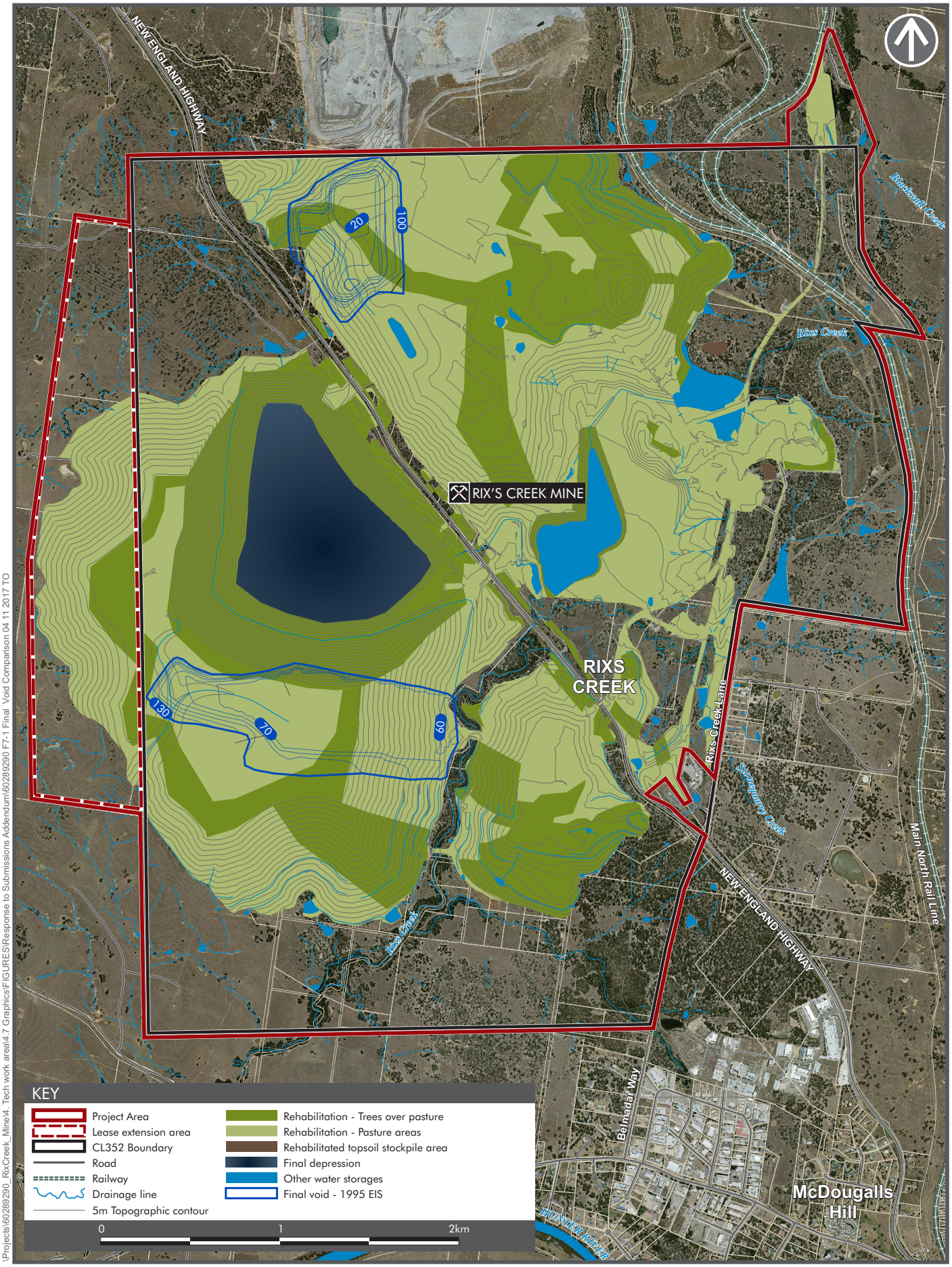
The approved final landform of the 1995 EIS (DA 49/94) allows for a 42.1 ha final void in the northern end of Pit 1 (North Pit) and a 79.2 ha final void in the middle of Pit 3 (West Pit), representing a total of 121 ha of final void. The final landform outlined in option 5 of the Mining Options Review Strategy, Appendix D to the EIS, results in one final void of 140 ha.

Figure 7-1 shows the proposed final landform with the Project Area returned to a pre-mining state, landforms vegetated and mining infrastructure removed. The entire 140 ha area of final void is designed at a maximum grade of 18 degrees with all areas being planted with appropriate plant communities. The groundwater study indicates the lower 80 ha of the void would eventually fill with ground water while the upper level of 60 ha would be stabilised with vegetation as indicated in **Figure 7-1**.

Additional figures (**Figure 7-2** – **Figure 7-4**) have been prepared in order to illustrate and highlight:

- Final landform design for the North Pit has been designed with micro / macro relief to give a more natural profile. The existing rehabilitated landform is typically at RL 140 with the final landform design containing several elevated areas, up to RL 155, interspersed with depressions designed as agricultural dams. From this elevation the landform blends down to the natural surface level at the New England Highway. Approximately 30 percent of SSD_6300 final landform would be between RL 140 and RL 155. Overall the average elevation of final landform would be RL 130. Refer **Figure 7-2**; and
- West Pit final landform design includes drainage paths used to provide micro / macro relief to the top of the final landform. These depressions would include use of existing natural landform integrated within the final landform design. Maximum elevation would be RL 165. Twenty four percent of the final landform would be between RL 160 and 165 to allow for a natural looking maximum landform elevation. The average elevation of the completed landform would be approximately RL 101. Refer to **Figure 7-4.**

As shown, the proposed final landform is a result of the detailed mine planning undertaken by Bloomfield prior to, and following the Planning Focus Meeting based on feedback from various agencies.



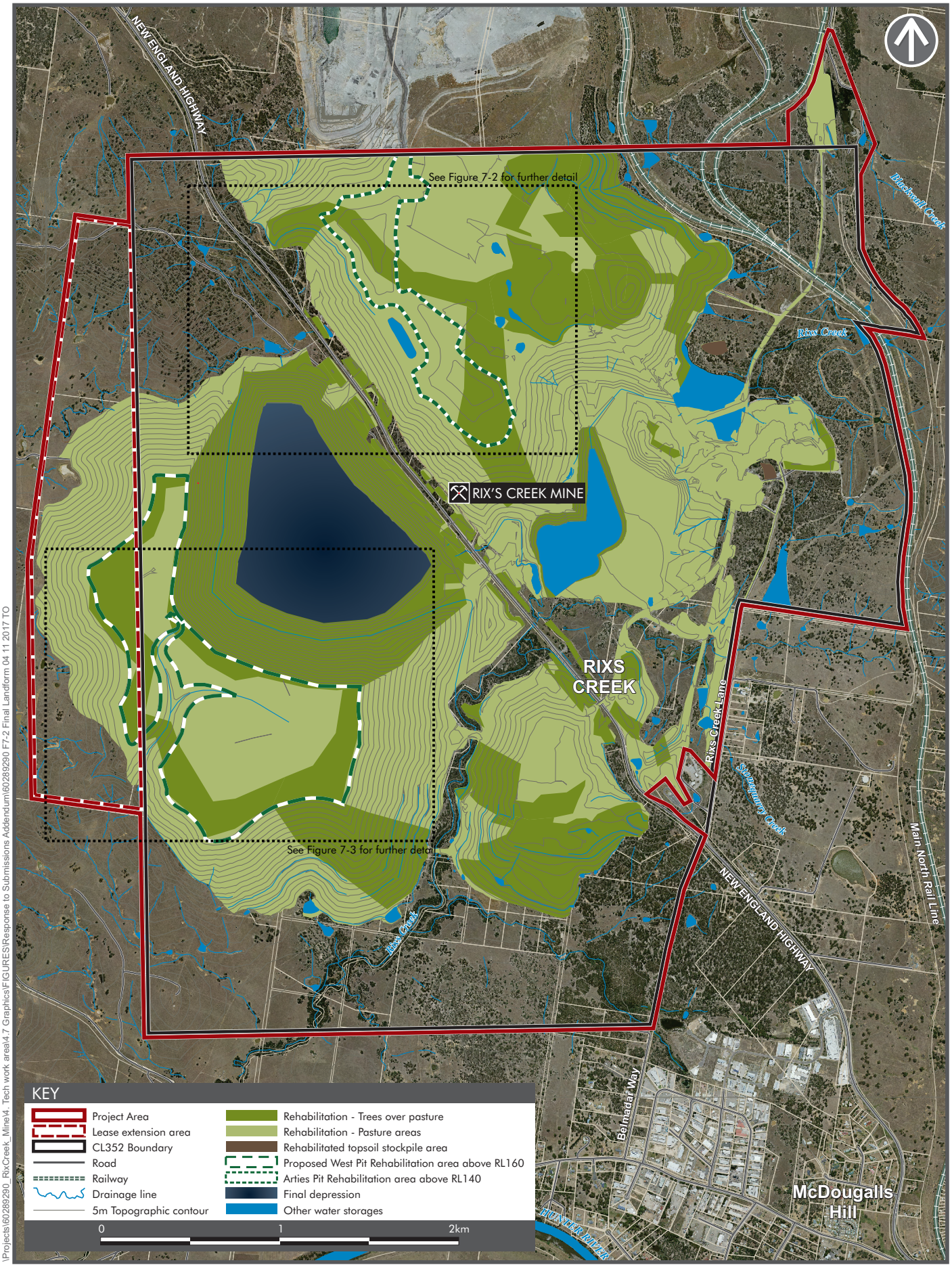
\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions Addendum\60289290 F7.1 Final Void Comparison 04 11 2017 TO

AECOM

FINAL VOID COMPARISON

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 7-1



\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions Addendum\60289290 F7-2 Final Landform 04 11 2017 TO

AECOM

FINAL LANDFORM - AVERAGE AND MAXIMUM HEIGHTS

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 7-2



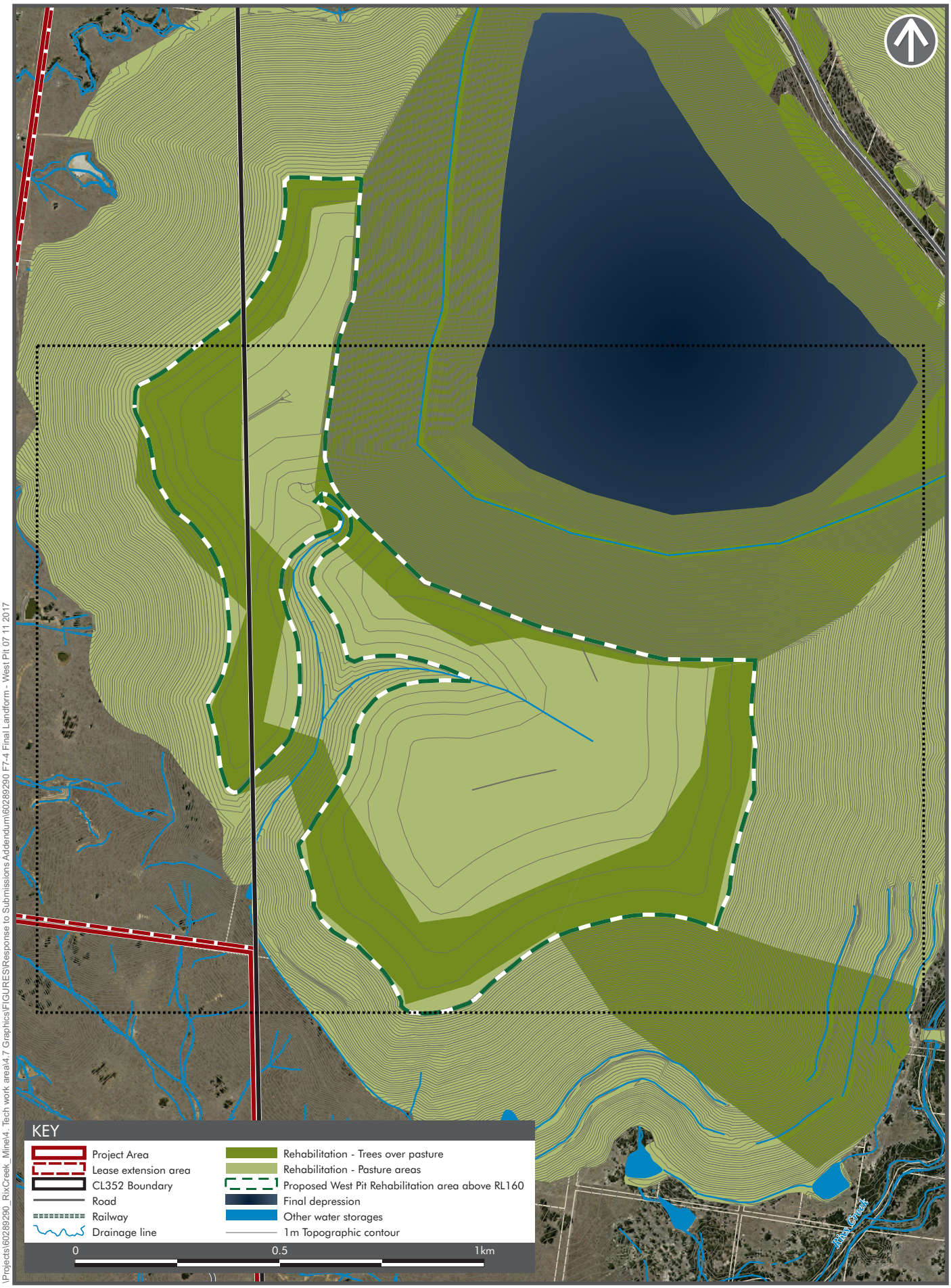
\Projects\60289290_RixCreek_Mine4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions Addendum\60289290 F7-3 Final Landform - North Pit 07 11 2017

AECOM

DETAILED FINAL LANDFORM - NORTH PIT

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 7-3



\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions Addendum\60289290 F7-4 Final Landform - West Pit 07 11 2017

AECOM

DETAILED FINAL LANDFORM - WEST PIT

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 7-4

Issue Description

In addition to details regarding the final landform DP&E also requested information in relation to:

- Visual impacts from other viewpoints with a focus on the visibility of the Mine from the New England Highway. Specifically it seeks an understanding of how existing and proposed visual screening along the highway would perform (noting that performance would be managed in accordance with the relevant requirements of the rehabilitation management strategy); and
- Further details regarding potential impacts to visual receivers located to the south of the Mine.

As part of historical and ongoing operations, the Mine has established visual bunds and plantings at the earliest possible time to allow for vegetation to become established and maximise visual screening. Four viewpoint locations have been reviewed to provide an indication of bunding and screening planting that the Mine has installed and is proposing through the Project. Viewpoint locations are detailed on **Figure 7-5**. Images from each of these viewpoints are shown on the below plates.

- Viewpoint No. 1 - New England Highway facing south into future West Pit continuation of mining area. Refer to **Plate 7-7**;
- Viewpoint No. 2 - New England Highway facing south into future West Pit continuation of mining area. Refer to **Plate 7-8**;
- Viewpoint No. 3 - New England Highway facing northwest into the future West Pit continuation of Mining area. Existing visual bund and screening planting established in 2013. Refer to **Plate 7-9**; and
- Viewpoint No. 4 – New England Highway. Refer to **Plate 7-10**.

In relation to the visual receivers located to the south of the Mine, those receivers on Dights Crossing Road identified in Character Zone 9 in the Project Visual Impact Assessment (RPS, 2015) were found to be visually impacted by the Project. **Plate 7-11** shows an indicative view from a location within Character Zone 9 as represented by viewpoint No. 5 on **Figure 7-5**. The Plate shows the edge of the rehabilitation area as clearly visible. It is also noted however that rehabilitation of land observed from this viewpoint has been well progressed with the majority of the landform having been completed and groundcover well established on the rehabilitated slopes. The Mine has demonstrated through rehabilitation across its site, including the area visible in **Plate 7-11,** that it can achieve a high standard of rehabilitation to minimise visual impacts.



\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions\60289290 F7-5 Viewpoint Locations 07 11 2017 TO

AECOM

VIEWPOINT LOCATIONS

Rix's Creek Continuation of Mining
Response to Submissions

FIGURE 7-5

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\Projects\60289290_RixCreek_Mine4 - Tech work area\4.7 Graphics\FIGURES\Response to Submissions Addendum\60289290 NEH Visual Screening Planting Plate 1 16 01 2017 TO



AECOM

NEW ENGLAND HIGHWAY FACING SOUTH INTO FUTURE WEST PIT CONTINUATION OF MINING AREA

Rix's Creek Continuation of Mining
Response to Submissions

PLATE 7-7

\Projects\60289290_RixCreek_Mine4 - Tech work area\4.7 Graphics\FIGURES\Response to Submissions Addendum\60289290 NEH Visual Screening Planting Plate 2 16 01 2017 TO



AECOM

NEW ENGLAND HIGHWAY FACING SOUTH INTO FUTURE WEST PIT CONTINUATION OF MINING AREA

Rix's Creek Continuation of Mining
Response to Submissions

PLATE 7-8

\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions Addendum\60289290 NEH Visual Screening Planting Plate 3 16 01 2017 TO



AECOM

NEW ENGLAND HIGHWAY FACING NORTHWEST INTO THE FUTURE WEST PIT CONTINUATION OF MINING AREA.
EXISTING VISUAL BUND AND SCREENING PLANTING ESTABLISHED IN 2013

Rix's Creek Continuation of Mining
Response to Submissions

PLATE 7-9

\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions Addendum\60289290 NEH Visual Screening Planting Plate 4 16 01 2017 TO



AECOM

NEW ENGLAND HIGHWAY
Rix's Creek Continuation of Mining
Response to Submissions

PLATE 7-10

\Projects\60289290_RixCreek_Mine\4. Tech work area\4.7 Graphics\FIGURES\Response to Submissions\60289290 F5-6 West Pit Rehabilitation 08 07 2016 TO



AECOM

VIEW FROM MAISON DIEU ROAD (VIEWPOINT 5 CHARACTER ZONE 9)

Rix's Creek Continuation of Mining
Response to Submissions

PLATE 7-11

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7.14 Community Consultation

7.14.1 Regional Community Consultation

Submission Identification: SIG07, SIG10, PS007, PS039, PS047, PS048, PS051, PS052, PS059, PS063, PS064.

Issue Description

Submissions relating to community consultation and concern that regional community groups or individuals were not consulted.

Response

Section 9.0 of the EIS described the consultation that was undertaken with government agencies, key stakeholders and members of the community. Project information was available on the Rix's Creek Mine website and other communication tools were utilised such as newsletters, letter box drops, fact sheets and an open day. Newspaper advertisements and feature articles were placed in local newspapers such as the Singleton Argus and the Coalface Publication. Additional consultation was provided to those residents in close proximity to the Mine, including meetings to discuss the Project in detail.

Regional community groups had access to Project information through the Mine website, DP&E website and the newspaper articles. Additional consultation was also undertaken during the public exhibition of the EIS is described in **Section 2.0** of this RRTS Report. The EIS was available for public review at various locations, including locations in Sydney and Singleton. An advertisement announcing the public exhibition of the EIS was placed in the Singleton Argus as well as the Newcastle Herald. This allowed individuals and community groups from local or regional areas to make a submission and provide feedback or raise issues relating to the Project.

7.15 Economic Assessment

Submission Identification: SIG01.

This submission raised issues regarding the economic assessment of the Project that was undertaken by the economic consultant KPMG. Specifically the issues related to coal price assumptions, labour premiums, the quantification of external costs and the assessment of economic impact. Throughout the preparation of this RRTS Report, the DP&E also raised additional queries about the economic assessment. KPMG have provided a response to the issues raised in this submission and subsequently by the DP&E. A full copy of the response is provided at **Appendix N** and a summary is provided below.

7.15.1 Coal Price Assumptions

Issue Description

The submission noted that the economic assessment used forecast coal prices that were higher than the World Bank estimates for January, April, July and October 2015, which may overstate the value of the Project. The submission also suggested that revenue estimates appear to be in present value US dollars, while other costs and benefits appear to be in Australia dollars.

Response

The economic appraisal was undertaken as at July 2014 with all results reported in 2014 Australian dollars. The analysis relied on coal price forecasts published by the World Bank, *Commodity Market Outlook, July 2014*. These prices were converted to real Australian dollars based on exchange rates and the consumer price index as at time of the analysis.

The analysis assumes a long term average price of slightly below $100 per tonne (Australian dollars(A)). It is recognised that, given the long term nature of the Project, there would be variation in coal prices. However, the assumed price adopted in the analysis is broadly consistent with price assumptions adopted by the NSW Department of Industry (Division of Resource and Energy), specifically:

- A$80 per tonne in the short term for export thermal coal;
- A$75 to A$100 per tonne in the medium to long term for export thermal coal;
- A$100 per tonne in the short term for export coking coal; and
- A$120 per tonne in the medium to long term for export semi soft coking coal.

As outlined above and reiterated in the Economic Addendum Report (Refer **Appendix N**), the economic appraisal was undertaken as at July 2014 with all results reported in 2014 Australian dollars. The analysis relied on coal price forecasts published by the World Bank (in July 2014). These prices were converted to real Australian dollars based on assumed CPI (3 per cent) and the US dollar exchange rate at the time of the analysis (AU$1 = US$0.85).

The analysis assumed a long term average price of slightly below $100 per tonne (Australian dollars). As the analysis extends beyond the forecast years, the forecast price for 2020 was adopted as the assumed price for the remaining analysis years. The assumed coal prices are outlined in **Table 7-7**.

Table 7-7 Assumed coal prices in Australian dollars

	2014	2015	2016	2017	2018	2019	2020-2038
Coal price ($/tonne)	93.06	95.25	96.15	97.05	97.95	98.72	99.49

In considering the impact of changes in coal prices in the short to medium term, changes in costs of the Project should also be considered. Recent consultation with Bloomfield suggests that, since the completion of the economic analysis in 2014, there have been a number of changes that have potential to reduce the costs associated with the Project. The changes are primarily associated with purchase of the Integra Mine and include:

- Acquisition of the Integra Mine Rail Loop that is expected to result in cost savings of approximately $4.5 million per annum that would otherwise be required in access fees. These cost savings are expected to result from savings in rail loop access charges (previously paid to the owner of the rail loop) net of expected rail loop operational expenses;
- Excess mobile plant and mining machinery purchased through the Integra Mine acquisition used to refresh the Rix's Creek Mine fleet and provide savings in forecast mobile fleet replacement capital expenditure of approximately $85.6 million over the first 16 years of the Project;
- Excess mobile mining machinery also allows savings on repairs and maintenance with newer machinery replacing older less efficient machines that require more frequent maintenance. Excess components and inventory purchased through the Integra Mine acquisition can reduce repairs and maintenance costs by $6.5 million over the first 2 years; and
- The operation of the Mine and Integra Mine would largely utilise the Bloomfield management and corporate staff. The effect of this is a reallocation of management salaries overheads from the Mine to Integra Mine. This is expected to result in a saving of 30 per cent of management overheads or $2.8 million per annum.

It is noted that the submission made by DRG included an assessment of the size, quality and availability of the coal resource as well as an estimate by DRG of the future coal price and expected royalties. The DRG submission also stated support for the Project as a responsible utilisation of the State's coal resources that would provide continued employment and bring economic benefits to the local region and the State as a whole.

7.15.2 Cost-Benefit Analysis

Issue Description

The cost-benefit analysis does not appear to include:

- An estimation of royalties to be received by NSW;
- The proportion of company tax to be received by NSW;
- The net producer surplus; or
- A full analysis of the cost of mitigating environmental and social impacts (a cost to the company) as compared to the base-case (no mining from 2019).

Response

Royalties and tax are typically excluded from an economic appraisal as they represent a transfer from one party to another. In the case of the analysis of the current Project, royalties and company tax represent a cost to Bloomfield and an equivalent benefit to government. Accordingly, inclusion of royalties and company tax has no net impact on the overall analysis result. It is noted that inclusion of royalties and company tax impacts the distribution of costs and benefits. However, distributional impacts were not the focus of the KPMG analysis.

Net producer surplus is equivalent to the revenue from operations less the costs of the Project. While not specified in the analysis as a benefit, producer surplus is effectively included in the analysis. The economic analysis considers full revenue and full costs associated with the Project. The difference between these two analysis components, the producer surplus, forms part of the analysis results.

The costs of mitigation activities that would be undertaken by Bloomfield is included in the costs associated with operating the Project. Specifically, these costs include:

- Environmental monitoring;
- Waste management;
- Rehabilitation costs;
- Licenses;
- Other environmental related activities; and
- Equipment replacement.

As detailed in the Economic Impact Assessment that formed part of the EIS (Appendix W to the EIS) and the subsequently supplied information contained in **Appendix N**, the cost of mitigation measures, represented as environmental externalities is calculated to be $4.5M. In regards to the comparison against the base case, the Section 4.0 of the Economic Impact Assessment (Appendix W to the EIS) assesses the potential economic impacts of the project against a base case scenarios which includes:

- Continuation of existing operations until 2019 when current approval expires;
- Cessation of activity in 2019 to be followed by rehabilitation activities; and
- Land being returned to its next best use (nominally agriculture) following cessation in 2019.

For the purposes of comparison against the based case, the environmental externality costs associated with the proposed mitigation measures refer to additional costs to the proponent beyond the life of the current development consent.

7.15.3 Labour Premiums

Issue Description

The submission queried the inclusion of a wage premium and the assumption that labour is not priced at its opportunity cost.

Response

The economic assessment includes quantification of the economic benefit to workers associated with the Project. Inclusion of this benefit is consistent with the recently finalised NSW Government G*uidelines for Economic Assessment of Mining and Coal Seam Gas Proposals* (see Table 3.1 in the guidelines).

The rationale for inclusion of the wage premium is recognition of the economic benefits associated with continued operation of the Mine for the local community. Importantly, as outlined Section 3 of the KPMG report (Appendix W of the EIS), the number of unemployed persons in the Hunter Valley region has increased significantly over the last two years and average individual taxable income is significantly lower in the region relative to the State average.

The potential for labour premiums is increasingly compelling as some excess capacity emerges in the resources sector. Cessation of operations at the Mine would likely result in personnel seeking alternate employment. These employees may face difficulty in obtaining alternate employment at their current wage levels given the lower commodity price environment.

Social impact analysis relating the Project assessed the areas of resilience and risk in the local community. The analysis identified that the "…*lack of economic diversity in the Hunter region and dominance of mining industry employment and associated occupations*…" potentially made the region "…*vulnerable to changes in mining activity*…".

7.15.4 External Costs

Issue Description

The submission raised a concern that no attempt to quantify external costs other than greenhouse gas was made and noted that while this may be necessary due to data limitations, the economic assessment did not consider any degree of uncertainty around environmental impact (such as biodiversity and noise). The DP&E noted that the valuation of the greenhouse gas emissions is based on a very low European carbon price and requested a sensitivity analysis.

Response

As outlined in Table 4.1 of the KPMG report (Appendix W of the EIS) and the Economic Addendum Report (**Appendix N**), environmental externalities were identified as a potential cost associated with the Project. The report draws on various third party publications pertaining to the specific development to highlight, and undertake a cost valuation of the potential environmental externalities, including:

- Air quality;
- Ecology (vegetation);
- Noise;
- Soils an geology;
- Surface water;
- Groundwater; and
- Heritage.

The third-party environmental impact reports generally concluded that the environmental impacts were manageable and established appropriate mitigation measures. An assessment of air quality impacts quantified the air quality impacts although noted that these would likely be ameliorated. Despite this amelioration, these air quality impacts were quantified and included in the economic costs. It is noted that since the finalisation of the economic analysis in July 2015, noise and air modelling have been revised. It is agreed that economic analyses should be based on the most recent information and any future analysis should consider any subsequent technical and environmental analysis findings. It is also noted that environmental externalities reflect a small proportion (less than one per cent) of total project costs and minor changes are unlikely to have a significant bearing on overall analysis results.

The unit price of Greenhouse Gas (GHG) emissions adopted at the time of the analysis (2014) was based on advice from the Department of Environment (Commonwealth) and was based on the Renewable Energy Target (RET) Review undertaken in the months leading up to the date of the analysis. It is recognised that there is some speculation regarding an appropriate assumption for valuation of GHG emissions and a sensitivity analysis would demonstrate the impact of variation in this assumption on analysis findings.

As requested by DP&E sensitivity analysis was applied to the valuation of greenhouse gas emissions as detailed in **Appendix N.** In order to provide further details regarding how variation in carbon price assumptions may impact on the findings of the economic assessment an indicative sensitivity analysis was performed. The outcomes of this sensitivity analysis are detailed in **Table 7-8.**

Table 7-8 Indicative Sensitivity Analysis Results – Carbon Price Assumptions

Carbon price assumption ($/tonne)		Benefits ($m)	Externalities ($m)	Other Costs ($m)	Total Costs ($m)	NPV[2] ($m)	BCR[3]
$4.75	50%decrease	1,072.2	2.3	816.0	818.3	253.9	1.31
$9.50[1]	Assumed price based on RET scheme	1,072.2	4.5	816.0	820.6	251.6	1.31
$14.25	50% increase	1,072.2	6.8	816.0	822.9	249.4	1.30
$19.00	100% increase	1,072.2	9.1	816.0	825.1	247.1	1.30
$28.50	200% increase	1,072.2	13.6	816.0	829.7	242.6	1.29

1. Price assumed in Project economic assessment
2. NPV = Net Present Value
3. BCR = Benefit Cost Ratio

This sensitivity analysis indicates that if carbon prices are to increase by 50% there would be an increase in $2.3M in externality costs and if carbon prices increased by 100% there would be an increase in externality costs of $4.6M. Conversely, a drop in carbon prices by 50% would see externality cost reduce by $2.2M.

7.15.5 Residual Value of Land

Issue Description

The submission commented that although not material to the cost benefit analysis due to its low value, the calculation of residual value of land (or cost of agricultural production foregone) is not provided.

Response

The residual value of land was estimated based on the total land area (185 hectares) included in the Project and an average land value of $10,000 per hectare. The average land value assumption was adopted based on information provided by Bloomfield pertaining to recent sales in the area of equivalent land.

The value of agriculture production foregone was estimated based on an assessment of the productive potential of the site prepared by Neil Nelson Agvice P/L (as referenced in the KPMG report at Appendix W of the EIS). The assessment found that the site had a cattle carrying capacity of between $20,000 to $30,000 per annum. If the site was managed intensively, the annual capacity may be as high as $45,000 per annum

7.15.6 Economic Impact Assessment

Issue Description

The submission suggested that no information was provided as to the data used in the computable general equilibrium (CGE) model, the assumptions that the model was based on, and the type of CGE model used. Specifically the submission referred to the estimate that the Project would increase mining employment in the wider NSW mining industry by a greater amount than in the local area.

Response

As outlined in Section 2.6 of the KPMG report (Appendix W of the EIS), comparative static CGE modelling was used to estimate the economic impact of the Project. Input-output (IO) tables published by the ABS for 2007-08 underpin the CGE model and provide details on the upstream and downstream linkages of sectors. Key assumptions adopted in CGE modelling were consistent with widely accepted values based on empirical studies and qualitative assessments of cost and sale structures in sectors.

7.15.7 Clarifications Requested Outside of the Exhibition Period

Since reviewing the EIS and original Response to Submission Report, DP&E raised additional questions in relation to the economic assessment that resulted from the independent peer review. Specifically DP&E requested additional information in regards to the following items:

- Royalties; and
- Quantification of environmental externalities.

These factors are considered below. A detailed response, KPMG Economic Analysis of Rix's Creek Environmental Impacts 3 March 2017, is provided in **Appendix N.** Also attached at **Appendix N** are KPMGs response to the questions raised by the independent per review of the economic assessment and additional analysis of the economics of the Projects environmental externalities. These collectively address questions raised following the exhibition of the EIS, and the below clarifications that were subsequently sought.

Issue Description

DP&E requested that the potential royalties that would be generated by the Project be reviewed in regards to the coal prices assumptions that were used in the original assessment.

Response

As noted in the KPMG Addendum Report (May 2016), Royalties and taxes are typically excluded from an economic appraisal as they represent a transfer from one party to another. In the case of the analysis of the Project, royalties and company tax represent a cost to Bloomfield and an equivalent benefit to government. Accordingly, inclusion of royalties and company tax has no net impact on the overall analysis result.

It is noted in the KPMG Addendum Report that the inclusion of royalties and taxes impacts the distribution of costs and benefits. However, distributional impacts were not the focus of the KPMG analysis.

As noted in the KPMG Addendum Report, DRG has developed estimates of coal royalties based on an assumed price of A$80 per tonne for export thermal cost. For coking coal, DRG has assumed a short term price of A$100 and a medium to long term price of A$120 per tonne. Based on production of around 25 million tonnes (Mt) of product coal, being able to be economically mined, from 2016 to 2038, the typical annual royalty is estimated to be $9 million. Over the life of the Project, DRG estimated total royalties to be A$240 million or A$130 million in present value terms (based on a discount rate of 7 per cent) to NSW.

As noted in the KPMG Addendum Report, KPMG has developed similar estimates of coal royalties, although as noted above these are not included in the economic appraisal results. Specifically, the expected royalties relating to the project are estimated to be approximately $9 million per annum or $215 million over the life of the project ($133 million in present value terms). These estimates are based on the current share of allowable deductions (4.56 per cent as estimated based on the March

2016 Royalty Statement, the coal prices assumed in the KPMG analysis (equivalent to a long term average of slightly below $100 per tonne) and the current Ad Valorem rate of 8.2 per cent).

Estimates of royalties developed by CIE (June 2016) under "…conservative estimates of future coal price forecasts…" would be "…in the range of $100-130 million in present value terms". CIE note in their review that the driver of variation in royalty estimates are likely to be the result of differences in coal price assumptions.

Issue Description

DP&E requested additional information in regard to the quantification of environmental externalities.

Response

Quantification of the environmental externalities (as outlined in the KPMG Report dated July 2015) was based on the information available at that time. As noted in the KPMG Report (July 2015), quantification of air quality impacts is based on the following two assumptions:

- "*The Project is estimated to generate annual greenhouse gas (GHG) emissions of 0.047Mt CO2-e per annum*…" (Source: Todoroski Air Sciences 2015, Air Quality and Greenhouse Gas Assessment – Rix's Creek Continuation of Mining Project, draft report prepared for Rix's Creek Pty Limited, March 2015.); and
- "The value of GHG emissions assumed for the analysis is equivalent to the shadow carbon price modelled for the Independent Expert Panel reviewing the (RET) scheme. The shadow carbon price is based on the long-term spot market price for European permits and is approximately $9.50 per tonne of carbon, escalating at 3 per cent in real terms" (Source: Acil Allen 2014, RET Review Modelling Results, prepared for the RET Review Panel, August 2014).

The value of emissions is the product of volume and price, that is:

Annual value of air quality impacts = Annual emission volume X Index carbon price

It is recognised that the carbon price is subject to variation based on a variety of factors, however, the assumption adopted at the time of the analysis was consistent with advice received from the Commonwealth Department of Environment and Energy. If there has been subsequent analysis of emissions, these would not be reflected in the economic analysis.

Following a request from Bloomfield, KPMG conducted an indicative sensitivity analysis of the impact of change in the carbon price assumption. The findings of this analysis are reproduced in **Table 7-9** for reference and additional sensitivities added to reflect carbon prices similar in magnitude to the Social Cost of Carbon estimates developed by the US EPA.

Table 7-9 Indicative sensitivity analysis results - Carbon Price Assumptions

Carbon Price Assumption ($/tonne)		Benefits ($M)	Externalities ($M)	Other Costs ($M)	Total Costs ($M)	NPV ($M)	BCR
$4.75	50 per cent decrease	1,072.2	2.3	816.0	818.3	253.9	1.31
$9.50	Assumed price based on RET scheme	1,072.2	4.5	816.0	820.6	251.6	1.31
$14.25	50 per cent increase	1,072.2	6.8	816.0	822.9	249.4	1.30
$19.00	100 per cent increase	1,072.2	9.1	816.0	825.1	247.1	1.30
$28.50	200 per cent increase	1,072.2	13.6	816.0	829.7	242.6	1.29
$57.00	500 per cent increase	1,072.2	27.2	816.0	843.3	228.9	1.27
$104.50	1000 per cent increase	1,072.2	49.9	816.0	866.0	206.2	1.24

Carbon Price Assumption ($/tonne)		Benefits ($M)	Externalities ($M)	Other Costs ($M)	Total Costs ($M)	NPV ($M)	BCR
$199.50	2000 per cent increase	1,072.2	95.3	816.0	911.4	160.8	1.18

To further quantify the economic implications of the direct environmental impacts of the Project, Bloomfield commissioned Todoroski Air Sciences to estimate the Project's contribution to GHG and particulate matter (PM). Additionally since the original KPMG analysis was completed, the NSW Government has released specific guidance regarding the approach and parameters for the quantification of environmental impacts of mining projects. From these inputs KPMG has developed the *Economic Analysis of Rix's Creek Environmental Impacts* 3 March 2017 **Appendix N.**

The estimated impacts of carbon emissions, focusing on Scope 1 carbon emissions and using the preferred assumption scenario (NSW Government preferred approach), is $5.2 million over the life of the project (refer **Figure 7-6**).

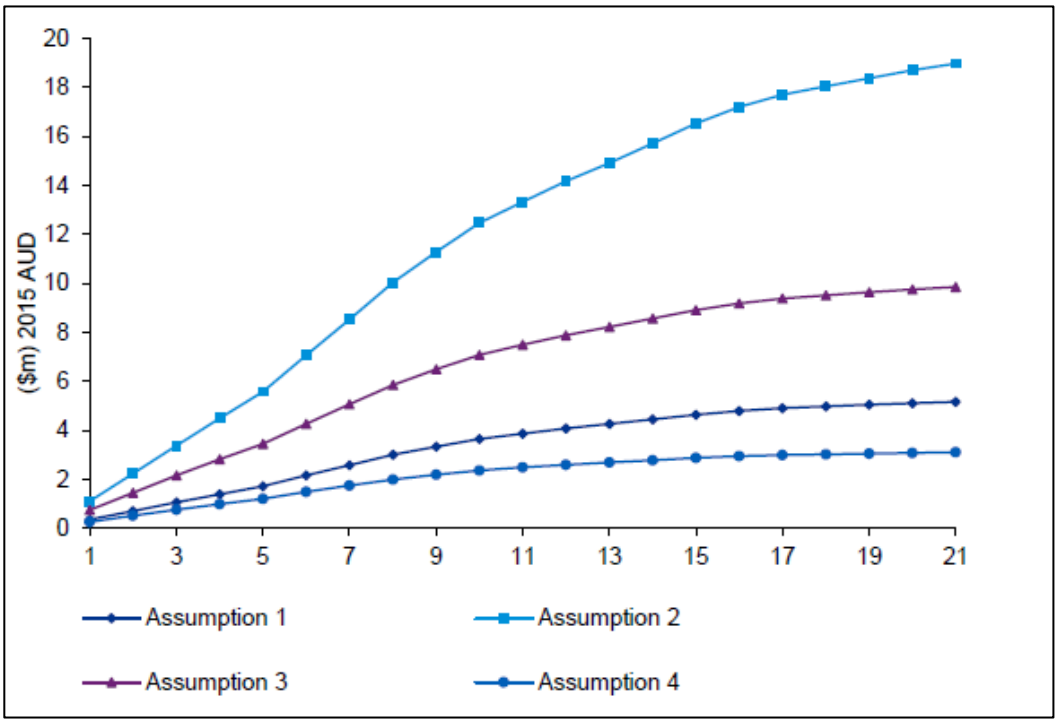


Figure 7-6 Projected cumulative Present Value costs of carbon emissions by unit cost ($ real = 2015)

Note: Assumption 1 = Forecast European Union Emission Allowance Units Price (NSW government preferred approach)
Assumption 2 = Australian Treasury Clean Energy Future Policy Scenario
Assumption 3 = US EPA Social Cost of Carbon
Assumption 4 = European Union Allowance futures price (as at July 2014)

To estimate the Project air quality impacts, the incremental annual mass of $PM_{2.5}$ was estimated and the Air Quality Valuation Workbook that supports the NSW Government *Guidelines for the economic assessment of mining and coal seam gas proposals* was utilised to quantify the costs. The economic cost of air quality impacts is estimated to range between $0.03 and $0.21 million for the years analysed ($0.21 million maximum production level) (refer **Table 7-10).**

Table 7-10 Costs of air quality impacts over project horizon

Timeframe	Impact (Present Value, $m real)
2017	0.10
2020	0.03
2023	0.21
2026	0.04

The KPMG analysis concluded that:

> *The original KPMG analysis undertaken in July 2015 found that total environmental externalities were $4.5 million over the life of the Project, or 0.5 per cent of total incremental costs of the project. The updated carbon emission impacts are higher than the previous estimates, particularly when estimates of air quality impact are also considered. For example, the Scope 1 carbon emissions using the preferred metric (Assumption 1) and air quality impacts result in total environmental externalities of approximately $6.5 million over the project life. Despite this, while not directly comparable, the updated environmental externalities still represent a small proportion of the total incremental cost of the Project.*

Economic Impacts Analysis

The economic impact analysis simulated an increase in coal exports based on average annual production for the first five years of operation. Consistent with standard approaches to economic and financial analysis, values were appropriately adjusted by CPI to ensure differences between model years and production values were accounted for. The economic simulation reported in the KPMG report excludes any capital impacts associated with mine expansion, consistent with the nature of the project largely reflecting a continuation of operations. No productivity adjustments were required, rather the simulation reflects an increase in export demand consistent with the nature of the likely demand for the output.

Consistent with the CIE recommendation and NSW Treasury guidelines for economic appraisal, given the reliance of simulation design and inherent variation between CGE model assumptions, CBA findings should be the primary consideration in assessments of projects.

7.16 Waste

7.16.1 Clarifications Requested Outside of the Exhibition Period

Issue Description

Due to the proposed change in the Mine schedule proposed in the original Response to Submissions Report compared to the EIS, DP&E requested that a revised schedule of anticipated waste generation be provided.

Response

The revised estimates of waste generation for the maximum production year of Project based on the amended Mine schedule are detailed in **Table 7-11**.

Table 7-11 Waste Generation Estimates for Amended Mine Schedule

Peak Production Years	Waste Oil (L)	Waste Metal (kg)	General Waste (kg)	Paper/ cardboard recycling (kg)	Oil filters
Quarter 1	108,800	77,504	29,795	2,504	3,168
Quarter 2	83,360	8,128	21,728	2,523	2,848
Quarter 3	82,720	0	24,987	3,187	4,752
Quarter 4	82,240	29,056	21,800	3,101	1,792
Total	**357,120**	**114,688**	**98,310**	**11,315**	**12,560**

In summary due to the reduced mining schedule, the Project is expected to generate lower volumes of waste over the life of the Project when compared to the waste production quantities detailed in the EIS.

7.17 Project Justification

7.17.1 Economic/Employment Justification

Submission Identification: SIG07, SIG10, PS007, PS051, PS052, PS058, PS059, PS061, PS063, PS064

Issue Description

Submissions suggesting that the justification for the Project (relating to revenue and provision of jobs for employees of Rix's Creek Mine and the Bloomfield Mine in East Maitland due to close in 2020) is no longer relevant, given that the proponent has recently purchased the adjacent Integra Mine.

Response

Bloomfield has longstanding export contracts to service which are currently supplied by combined production from both Rix's Creek Mine and the Bloomfield Colliery Open Cut Mine in east Maitland. Additionally Bloomfield's recommencement of production from the Integra Mine is being utilised to service former long term Integra Mine customers as well as the Bloomfield long term customer base. Upon closure of the Bloomfield Mine, it is anticipated that combined production from Rix's Creek Mine and Integra Mine would supply these contracts. This does not change the Proponent's intention to retain staff from the Bloomfield Mine where possible. Bloomfield Mine staff could be transferred to work at the Rix's Creek Mine or at the Integra Mine, depending on resource and production requirements.

Section 31.0 of the EIS summarised the justification for approval of the Project, which included biophysical, economic and social considerations. It was concluded that impacts from the Project could be suitably managed through the implementation of a range of management plans and with operations controlled to minimise impacts on the environment and community. Significantly, the Mine would build on its existing management system to minimise impacts for the duration of the Project. As the existing management system has demonstrated success to date, there is confidence that the proposed resource can be extracted in a manner which maximises benefits to the local and wider area as well as the State, while minimising potential impacts.

7.18 Cumulative Assessment

7.18.1 Cumulative Impacts Not Adequately Assessed

Submission Identification: SIG08, SIG10, SIG11, PS038, PS039, PS041, PS046, PS048, PS051, PS052, PS059, PS061, PS063, PS064

Issue Description

Submissions concerned that the cumulative impacts (eg air quality, noise, biodiversity, surface water, groundwater, and Aboriginal cultural heritage impacts and social impacts such as change to hours of operation and buffer zones for communities) have not been assessed adequately.

Response

Potential cumulative impacts were assessed in Section 26.0 of the EIS. Specific consideration of cumulative impacts was also incorporated into the impact assessment for certain environmental aspects including:

- Air quality (Section 11.4.4 of the EIS);
- Noise, vibration and blasting (Section 12.5.3 of the EIS);
- Groundwater (Section 16.4.7 of the EIS);
- Traffic and transport (Section 18.5.6 of the EIS); and
- Landscape character and visual amenity (Section 21.4.5 of the EIS).

Table 26-2 provided an assessment of the potential cumulative impact of the Project (which includes the continued use of all development for, or associated with, mining within the Project Area at the date of determination) for all aspects addressed in the EIS, including air quality, noise, vibration and blasting, biodiversity, soils, land capability and land use, hydrology and water quality, groundwater, Aboriginal and cultural heritage, traffic and transport, social, economic, landscape character and visual amenity, hazards and risks, greenhouse gas, waste management and rehabilitation.

The cumulative assessment included consideration of two separate levels of impact: localised cumulative impacts of the Project on the Project Area, and regional interaction with other developments, including other mining projects in the Hunter Coalfields.

Some submissions raised a concern about the social impact of a change to operations to 24 hour per day, 7 days per week. However as noted in the EIS (Section 1.1.2), the Mine currently has approval to operate 24 hours per day, 7 days per week and currently operates as required to meet production demands.

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8.0 Revised Management Measures

The Project EIS included a summary of the management measures that will be incorporated into the construction and operation of the Project. Following the receipt and consideration of submissions these management measures were reviewed and additional mitigation measures have been recommended in this RRTS Report. The final summary of Project management measures is provided in **Table 8-1**.

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Table 8-1 Summary of Management Measures

Ref#	Factor	Management and Mitigation Measures	Timing
Air Quality			
11.6.1	Air Quality General	Air quality management measures currently used to mitigate air quality emissions from current operations will continue to be implemented. An air quality monitoring network will be maintained to provide feedback into the predictive air quality management systems.	Duration of the Project
11.6.2	Dust Generation (Cut and Cover Tunnel)	Dust suppression measures such as the use of water carts and sprays will be utilised during construction activities to manage potential dust generation. Dust generating activities will be minimised during adverse (windy) weather conditions to reduce dust generation.	Duration of the Project
11.6.3	Dust Generation (Cut and Cover Tunnel)	A CEMP will be prepared and include details of construction specific air quality management measures, and implementation and enforcement during the construction period.	Prior to commencement of construction activities
11.6.4	Diesel fume management	Control measures that will be used to ensure emissions from diesel engines are minimised where possible include the following measures that will be applied for the Project: • Where possible, the excess use of vehicles and plant will be minimised by scheduling operations to maximise efficiency (e.g. using plant at or near to its capacity to minimise the amount of time utilised); • When not in use, engines of on-site vehicles and plant will be switched off; • Any new plant or vehicles purchased will have adequate pollution reduction devices fitted; • Vehicles and plant will be maintained and serviced according to manufacturer's specifications; and, • Fleet optimisation will be applied to reduce vehicle kilometres travelled.	Duration of the Project
Noise Vibration and Blasting			
12.6.1	Construction Noise	As part of the Cut and cover tunnel CEMP, noise management measures will be included consistent with the requirements of the Interim construction Noise Guidelines (ICNG) (DECC, 2009).	Prior to commencement of construction activities
12.6.2	Construction Noise	Construction work will be limited to standard construction hours as per Section 2.2 of the ICNG where practical.	During construction activities.
12.6.3	Operational Noise	The Mine will operate under an updated version of its existing Noise Management Plan.	Duration of the Project
12.6.4	Operational Noise	Noise model predictions will be used at the daily production meetings to plan evening and night time operations.	Duration of the Project
12.6.5	Operational Noise	Modifications to operating configurations will be planned to minimise potential off-site noise impacts if elevated noise levels are predicted.	Duration of the Project
12.6.6	Operational Noise	Trained site personnel will undertake attended noise monitoring during the night period, with priority given to receptor areas for which elevated noise predictions were provided (if any).	Duration of the Project

Ref#	Factor	Management and Mitigation Measures	Timing
12.6.7	Operational Noise	Operations at the site will be modified to reduce noise emission to below limits. Modifications include operating within the pit, in areas that provide a high degree of topographical shielding, and/or, progressively shutting down equipment, starting with plant operating in the most exposed areas.	Where noise levels exceeding a trigger level criterion are measured or predicted
12.6.8	Operational Noise	Follow-up attended monitoring will be undertaken to determine the effectiveness of modifications implemented.	Where noise levels exceeding a trigger level criterion are measured or predicted
12.6.9	Operational Noise	Measurements and actions will be documented for reporting to relevant stakeholders.	Duration of the Project
12.610	Operational Noise	Independent attended monitoring will be undertaken by noise consultants in addition to the Mine internal attended noise monitoring program to fulfil the Mine's EPL requirements.	As required by EPL
12.6.11	Operational Noise	Appropriate overburden emplacement levels/heights will be determined to allow shielded emplacement to occur deeper in the pit during adverse meteorological conditions.	Duration of the Project
12.6.12	Operational Noise	Haul route alignments within the pit will be designed to maximise the available topographical shielding provided by the pit shell.	Duration of the Project
12.6.13	Operational Noise	At an appropriate time in the progression of mining, two high elevation emplacement areas will be developed, to the north and south of the pit, separated by approximately 1300 metres.	Prior to 2023
12.6.14	Operational Noise	The Mine fleet replacement forecast program will plan the phase in of attenuated plant in accordance with the timeframes modelled in the Environmental Noise Assessment.	Duration of the Project
12.6.15	Operational Noise	A 4.5 metre high earth bund will be established to reduce noise emission to the south of the coal haul route.	Commencement of the Project
12.6.16	Operational Noise	An earth barrier will be maintained to the east side of the ROM coal pad (already constructed).	Duration of the Project
12.6.17	Operational Noise	Noise attenuation sheeting will be installed on the south and east facades of the CHPP.	Commencement of the Project
12.6.18	Operational Noise	Specific night operating configurations will be implemented during or prior to times of meteorological enhancement of noise (temperature inversions) subject to the specific meteorological conditions and the required level of noise mitigation required.	During or prior to times of meteorological enhancement of noise
12.6.19	Vibration and Blasting	The Explosive Management Plan will be updated to include established methodology for calculating blast limits for blasting in close proximity to the Rix's Creek Coke Ovens.	Commencement of the Project
12.6.20	Vibration and Blasting	The Explosive Management Plan will be updated to include monitoring requirements for compliance with ground vibration limits at the Rix's creek Coke Ovens.	Commencement of the Project
12.6.21	Vibration and Blasting	Checks to manage the potential impact of blasting on the stability of the New England Highway including details of changes to blasting practice and other appropriate measures which may need to be applied will be incorporated into the Explosive Management Plan.	Commencement of the Project

Ref#	Factor	Management and Mitigation Measures	Timing
12.6.22	Vibration and Blasting	Controls for the design of blasting and loading practises to be implemented to minimise Flyrock generation consistent with existing operations will be incorporated into the Explosive Management Plan.	Commencement of the Project
12.6.23	Vibration and Blasting	Traffic control on the New England Highway when blasting approaches closer than 500m to the Highway will be in accordance with the existing management plan prepared in consultation with RMS (include requirements in the Explosive Management Plan).	Commencement of the Project
12.6.24	Vibration and Blasting	Continuous vibrations recording instruments will be used when monitoring blasting events to provide closer scrutiny of the actual airblast measurements and more accurate reporting (incorporate into the Explosive Management Plan).	Commencement of the Project
Ecology			
13.5.1	Potential impacts to biodiversity	Mine planning will avoid the removal of vegetation and habitat where reasonable and feasible.	Duration of the Project
13.5.2	Potential impacts to biodiversity	Vegetation and habitat will only be removed in a staged manner with the inspection of habitat trees carried out before and during felling operations.	Duration of the Project
13.5.3	Potential impacts to biodiversity	Upper Hunter Strategic Assessment or FBA credits will be satisfied through the implementation of the offsetting strategy in agreement with the Minister for the Environment.	Duration of the Project
13.5.4	Potential impacts to biodiversity	The Mine will provide offsets in accordance with the Upper Hunter Biodiversity Plan including monetary contributions to the Upper Hunter Offset Fund as calculated through OEH calculators.	Duration of the Project
13.5.5	Potential for native fauna to be displaced from habitat during native vegetation clearing.	Significant ecological features associated with standing and dead timber will be assessed and monitored. A qualified and experienced fauna consultant will conduct pre-clearance surveys to ensure displaced wildlife is removed or relocated at the time of clearing.	Duration of the Project
13.5.6	Potential for native fauna to be displaced from habitat during native vegetation clearing.	Inspection of hollows will be undertaken by a qualified fauna ecologist prior to and immediately after tree felling. Felled trees supporting hollows will be stockpiled for later use in rehabilitation activities.	Duration of the Project
13.5.7	Potential for wildlife-vehicle collisions	Consideration will be given to implementing speed limits in areas which have elevated risk of collisions with wildlife.	Duration of the Project
Soil, Land Capability and Land Use			
14.5.1	Geotechnical Stability Management	The Mine stability monitoring program will continue to be implemented for the duration of the Project.	Duration of the Project

Ref#	Factor	Management and Mitigation Measures	Timing
14.5.2	Geotechnical Stability Management	Prior to Mining activities reaching the extent of the 2026 conceptual Mine Operations Plan / Rehabilitation Management Plan (whether that occurs before or after 2026), 3D mathematical computer modelling of the rest of Project (2026 – 2037) mining stability will be undertaken to reassess the potential stability impact of ongoing mining.	Prior to Mining activities reaching the extent of the 2026 conceptual mine plan
14.5.3	Soils Management	An internal soil stripping and management plan will be prepared to guide all topsoil stripping activities. As a minimum the management plan will include the following measures: • Details regarding appropriate soil stripping depths for the various soil types across the Mine; • The planned usages of anticipated top soils volumes as they become available. Stripping and stockpiling quantities will be matched to the Mine's ability to reuse stockpiled topsoils to minimise the time it is stockpiled; • Soil will preferably be stripped in a slightly moist condition. Material will not be stripped in either excessively dry or wet conditions. Whilst mining and construction schedules dictate stripping times, consideration should be given to near term weather forecasts; • Stripped material will be placed directly onto areas to be rehabilitated and spread immediately (if mining sequences, equipment scheduling and weather conditions permit) to avoid the requirement for stockpiling where possible. Stockpiles will not be placed near major drainage lines; • Soil will be graded or pushed into windrows; • Soil transported by dump trucks will be placed directly into storage. Soil transported by scrapers will be pushed to form stockpiles by other equipment (e.g. bulldozer) to avoid tracking over previously laid soil; • The surface of soil stockpiles will be left in as coarsely structured a condition as possible in order to promote infiltration and minimise erosion until vegetation is established; • As a general rule, a maximum stockpile height of 3 m will be maintained. Clayey soils will be stored in lower stockpiles for shorter periods of time compared to coarser textured sandy soils; • If long-term stockpiling is planned (i.e. greater than 12 months), stockpiles will be seeded and fertilised as soon as possible. An annual cover crop species that produces sterile florets or seeds will be sown; • Prior to re-spreading stockpiled topsoil onto reshaped overburden, an assessment of weed infestation on stockpiles will be undertaken to determine if individual stockpiles require herbicide application and / or "scalping" of weed species prior to topsoil spreading; • An inventory of available soil will be maintained to ensure adequate topsoil materials are	Duration of the Project

Ref#	Factor	Management and Mitigation Measures	Timing
		available for planned rehabilitation activities; and • Topsoil will be spread, treated with fertiliser and seeded.	
14.5.4	Post Mining Land Use Agriculture	A Mine Operations Plan will be prepared and implemented in consultation with DRG to establish a rehabilitation framework.	Commencement of Project
14.5.5	Post Mining Land Use Agriculture	The existing Rehabilitation Management Plan will be reviewed and updated to include areas to be disturbed and rehabilitated as part of the Project. This will include the rehabilitation of proposed agricultural areas to establish ecosystems for grazing.	Commencement of Project
Hydrology and Water Quality			
15.5.1	Surface Water	Where required the Water Management Plan will be updated and extended to include the additional water storages and regional catchments impacted by the Project.	Duration of the Project
15.5.2	Water Balance	The existing site water balance will be revised in consultation with the NSW Office of Water The revised site water balance will include the proposed operating requirements of the Project and detail management measure to be implemented for the management of water at the Mine.	Commencement of the Project
15.5.3	Surface Water Runoff	All sediment dams and water management systems will be designed in accordance with relevant standards (DECC, 2008). Regular testing of the water quality runoff will be conducted to ensure that water released from site is in accordance with regulatory standards. Any runoff water from disturbed areas identified to not be suitable for release will be pumped into the mine water management system.	Duration of the Project
15.5.4	Surface Water Runoff	Within five days of a runoff event, the proposed sediment dams (in disturbed areas) will be dewatered to provide free storage capacity of at least the settling zone volume.	Within five days after a runoff event
15.5.5	Surface Water Runoff	Sediment dams may be dewatered to receiving waters where TSS concentrations and EC are less than the selected water quality objectives after a runoff event.	Within five days after a runoff event
15.5.6	Surface Water Runoff	Where TSS exceeds the water quality objective, water in basins must be either: • Flocculated to reduce TSS; • Pumped to another water storage with available capacity; or • Pumped into the mine water management system.	When TSS exceeds the water quality objective
15.57	Surface Water Runoff	All surface water diversion drains, outlets, contour drains, catch drains and other waterways will be designed to convey peak runoff discharge rates for a 20 year ARI storm event.	Duration of the Project
15.5.8	Surface Water Runoff	The following measures will be implemented to manage flooding as part of the Mine Water Management framework: • Protect the open cut and the Pit 2 tailings dam from inflows due to the 1% AEP Upper Limit flood in Rix's Creek. The nature of the protective actions should be decided by the mine operator; • Incorporate review of flood protection measures into the design systems of the mine,	Duration of the Project

Ref#	Factor	Management and Mitigation Measures	Timing
		specifically for Pit 3 along Rix's Creek. The purpose is to ensure containment berms are of adequate height and integrity to withstand the 1% AEP Upper Limit flood in Rix's Creek; • Review the integrity and height of existing berms along the perimeter of Pit 3, upstream of the culvert crossing to Pit 2 tailings dam; and • Ensure that the minimum 35 m floodway width at the culvert crossing to Pit 2 tailings dam is maintained.	
15.5.9	Water Quality	A water management system will be implemented which includes: • Diversion of runoff from undisturbed catchments away from disturbed areas, wherever possible, using surface drains; • Treatment of runoff from overburden emplacements using sedimentation dams prior to discharge from the site; and • Collection of runoff from mining areas (including coal stockpiles) within Mine water dams for recycling on site.	Commencement of the Project
15.5.10	Off Site Water	Where the Mine requires access to off-site water the following options may be taken: • The mine will negotiate water sharing agreements with neighbouring mines to access sources of excess water on the sites known to be a management problem and avoid drawing on the external catchment altogether; or • The mine will access the unregulated river allocations it owns in the Rix's Creek catchment; or • The mine will purchase additional units on the open market; or • The mine will approach other Water Allocation Licence holders for a term transfer. If additional water is required, where the above options do not suit, the mine will establish a pump and pipeline on the Hunter River to access the 258 unit general security allocation it currently owns (subject to separate approval).	When the mine requires access to off-site water
15.5.11	Sediment and Erosion	Progressive installation of surface drainage and catchment dams will be carried out to direct surface runoff to sediment settling structures before the water is released from site.	Duration of the Project
Groundwater			
16.5.1	Groundwater	Site Specific Trigger Values will be developed through statistical analysis of monitoring data. These trigger values will determine whether mining related impacts on groundwater are occurring, and if so, the appropriate management response.	Duration of the Project
16.5.2	Groundwater	The existing groundwater monitoring management plan will be updated to include an annual review of monitoring data by a hydrogeologist in order to assess the impacts of the Project on the groundwater environment, and to compare observed impacts with those predicted from groundwater impact modelling.	Commencement of the Project

Ref#	Factor	Management and Mitigation Measures	Timing
16.5.3	Groundwater	The existing groundwater monitoring management plan will be updated to include a modelling post-audit carried out after approximately two years following Project initiation and then at five year intervals after this. Modelling post-audits should also be conducted any time where inflows or impacts vary significantly from predictions. Following any review or post-audit, the Project model will be recalibrated and additional impact predictions carried out in relation to the Project.	Commencement of the Project
Aboriginal and Cultural Heritage			
17.5.1	Aboriginal Heritage	An Aboriginal Cultural Heritage Management Plan for the Project will be prepared in consultation with Registered Aboriginal Parties, OEH and DP&E. The Aboriginal Cultural Heritage Management Plan will provide: • Details regarding the salvage and collection of artefacts that will be impacted during the Project; • Instructions on how collected artefacts will be recorded and managed (including by whom). • Details of an archaeological excavation program to examine potential for subsurface deposits adjacent to artefact scatter sites AHIMS #37-6-0235 (adjacent to Deadman's Gully), Rix's Creek AS15 (adjacent to Rix's Creek) and Rix's Creek AS16 (adjacent to Rix's Creek); • Details regarding the measures that will be implemented to protect sites that won't be impacted by the Project, including measures for the annual monitoring of these sites; • Procedures for the recording of previously unrecorded sites or human remains, if these are uncovered during the Project; and • Measures for cultural awareness inductions for staff, managing access to non-salvaged sites and for the continual update and review of the Aboriginal Cultural Heritage Management Plan.	Commencement of the Project
17.5.2	Historic Heritage	A Historic Heritage Management Plan will be prepared for the Project and will include the following as a minimum: • A list and map indicating the locations of historical heritage items identified within the Project Area; • Significance assessment and Statement of Significance for each historical heritage item; • Detailed management and mitigation measures for impacted historical heritage items, including: - Monitoring, archival recording and surface collection procedures; and - Unexpected finds procedures, including a specific procedure for human remains.	Commencement of the Project

Ref#	Factor	Management and Mitigation Measures	Timing
Traffic and Transport			
18.6.1	Operational Rail Traffic Impacts	Forecast tonnages will be provided to ARTC for rail transport planning purposes.	Commencement of the Project
18.6.2	Traffic impacts generated during construction of the cut and cover tunnel	A Construction Traffic Management Plan will be put in place to manage the traffic generated during construction of the cut and cover tunnel. It will be prepared in consultation with RMS and in accordance with the *RMS Traffic Control at Worksites Manua*l and *AS1742.3 Manual of Uniform Traffic Control Devices* (2002). As a minimum, the following will be included: • Relevant Road Occupancy Licences will be obtained prior to works in the road corridor; • Dilapidation surveys of the New England Highway in proximity to the construction site will be undertaken. These will note the existing condition of the road to allow post construction surveys to identify impacts (if any) that have occurred to the New England Highway as a result of construction works and therefore identify required remediation works; • An audit of the condition of construction vehicle routes will be undertaken prior to the commencement of work, to ensure that construction traffic does not result in a degradation of the road surface to the detriment of all road users; • An 80km/hr speed zone will be implemented for the duration of works along the construction zone to protect the safety of workers and road users. The proposed bi-directional side-track will be designed for 80km/hr speeds and will serve to minimise the impacts of the works on passing traffic, which will use the existing carriageway until the side-track is built, and remain on the side-track until works on the existing carriageway are complete; • Slower 40km/hr speed zones will be implemented for short periods for tasks such as installing safety barriers and carrying out traffic switches. It may be necessary for traffic to operate in one lane while traffic switches are being carried out. On these occasions, traffic will be controlled via portable traffic lights or traffic controllers at either end of the work site; and • Where practicable, works having impact to traffic on the New England Highway will be undertaken outside peak times.	Prior to Construction
Social			
19.8.1	Social	A dedicated enquiry and complaints hotline will be operated by the Mine for the duration of the Project. Complaints received will be managed through a complaints register which details complaints, follow up actions and closure out procedures. Complaints will be detailed in Annual Environmental Reports. Ongoing monitoring, management and mitigation activities in relation to community concerns	Duration of Project

Ref#	Factor	Management and Mitigation Measures	Timing
		will continue.	
19.8.2	Social	Sponsorship and funding through the Bloomfield Foundation (and other programs) will continue.	Duration of Project
19.8.3	Social	Information will continue to be disseminated to the community through the implementation of community information sessions, feedback through social, online and print media and by including targeted information in community information sheets about activities to be undertaken (in relation to issues such as noise mitigation, dust mitigation, water monitoring, etc.).	Duration of Project
19.8.4	Social	In addition to the community hotline, consultation with immediate neighbours and stakeholders will continue through face to face consultation, to monitor and assess any issues of concern to these stakeholders.	Duration of Project
19.8.5	Social	The Community Consultative Committee (CCC) will continue over the life span of the project, and the minutes of the CCC will be made available to interested community members on a dedicated website. Regular evaluation of the CCC process will be undertaken (including membership) to ensure that the committee membership is balanced and the committee is achieving its objectives.	Duration of Project
19.8.6	Social	Contributions to local infrastructure support through a Voluntary Planning Agreement will continue to be negotiated between Bloomfield and Singleton Council. As the Mine is located in proximity to Singleton Heights, Bloomfield will continue to support Council in the provision of community services to that location in accordance with Singleton Council's "2013 Community Strategic Plan" where applicable.	Duration of Project
19.8.7	Social	Should there be a requirement to employ staff over and above the dedicated Bloomfield workforce, preference will be shown to members of the local community where feasible.	Duration of Project
Economic			
20.5.1	Economic Impact	Bloomfield will continue to operate its current community contributions programs in consultation with relevant organisations at the discretion of Bloomfield.	Duration of Project
Landscape Character and Visual Amenity			
21.5.1	Visual Impact	Progressive rehabilitation of modified and unmodified landforms on the site will continue to be implemented over the life of the Project and be undertaken in accordance with the existing Mining Operations: Landscape Management Plan. Rehabilitation will include extensive planting of grasses, shrubs and tree species on all newly formed landforms as appropriate to the proposed future land use.	Duration of Project
21.5.2	Visual Impact	Localised vegetation screens using appropriate species will be established in certain locations. In particular, vegetation screening will be provided along the length of the New England Highway within the Mining Lease especially along the western side of the New England	Duration of Project

Ref#	Factor	Management and Mitigation Measures	Timing
		Highway. Where new screen planting is proposed, it will be placed on the upper half of a bund to obstruct views to stockpiles.	
21.5.3	Visual Impact	A Visual and Landscape Management Plan will be prepared including measures to address: • Design and location of new lighting to avoid direct line of sight from areas surrounding the site where practicable; • Location of operational mobile lighting to minimise light spill where reasonable and feasible; • Retention of existing tree cover and safeguarding to the fullest extent where reasonable and feasible, particularly in the vicinity of the tunnel construction and when undertaking works in close proximity to the screening vegetation; and • Landscaping works, including shrub and tree planting to screen infrastructure. Planting will be progressive through the life of the Project and maintained to optimise visual screening.	Commencement of the Project
21.5.4	Visual Impact	Progressive rehabilitation and tree planting will be carried out in accordance with a Rehabilitation Management Plan.	Duration of Project
Hazards and Risks			
22.5.1	Dangerous Goods	The storage of dangerous goods will be managed is accordance with: • Australian Standard AS 2187.1 Explosives – Storage, Transport and Use; • Australian Standard AS 1940:2004 – The Storage and Handling of Flammable and Combustible Liquid; and • Manufactures instructions.	Duration of Project
22.5.2	Bushfire	A monitoring program will be conducted to monitor fuel load during the fire season.	Duration of Project
22.5.3	Bushfire	Fuel reduction activities will be undertaken to limit the speed and spread of potential unscheduled fires. This will include thinning or removal of undergrowth.	Duration of Project
22.5.4	Bushfire	Hazard reduction burning will not be undertaken during periods of declared total fire bans.	Duration of Project
22.5.5	Bushfire	Fire trail and access roads to, from and within the Mine landholdings will continue to be maintained to a level suitable to provide access for Rural Fire Service tankers.	Duration of Project
22.5.6	Bushfire	The responsibilities for fire management will continue to be those outlined in the Mine Emergency and Management Plan.	Duration of Project
22.5.7	Bushfire	In the instance of a bushfire event, the existing Emergency Response Procedures for the Mine will be implemented.	Bushfire event
22.5.8	Contamination	Any spillages will be reported in accordance with the Environmental Incident Emergency Response plan and corrective actions undertaken as appropriate.	Reportable event
22.5.9	Spontaneous Combustion	The Spontaneous Combustion Management Plan will be updated to reflect the operation of the Project.	Commencement of the Project

Ref#	Factor	Management and Mitigation Measures	Timing
22.5.10	Spontaneous Combustion	Regular visual inspections of stockpiles will be undertaken for the presence of spontaneous combustion. Inspections will involve observing stockpiles for any visible signs of smoke or other obvious signs of heat production.	Duration of Project
22.5.11	Spontaneous Combustion	Future revisions of the Mine Operations Plan will be undertaken as required providing an opportunity to review spontaneous combustion procedures if necessary.	Duration of Project
22.5.12	Mine Subsidence	Regular visual inspections of the area subject to historical underground mining will be undertaken.	Duration of Project
22.5.13	Mine Subsidence	In the event of subsidence being identified, the area will be flagged off with No-Go flagging and appropriate measures undertaken to make the areas safe i.e. backfilling of sink holes and surface cracks.	When subsidence is identified
Greenhouse Gas			
23.6.1	Greenhouse Gas	A Greenhouse Gas and Energy Efficiency Management Plan will be implemented for the Project. The plan will include the following as a minimum: • Provision for the monitoring of fuel consumption; • Provision for the monitoring of total site electricity consumption; • Requirements for the maintenance of plant and machinery to ensure efficient operation; • Assessment of the potential use of alternative fuels where economically and practically feasible; • Ongoing scheduled and preventative maintenance to ensure that diesel and electricity powered plants operate efficiently; • The development of targets for GHG emissions and energy use, as well as monitoring and reporting against these; and • Establishment of an energy awareness program for staff and contractors.	Commencement of the Project
Waste Management			
24.5.1	Waste Management	The Waste Management Procedure will be reviewed and updated prior to the operation of the Project to make sure it meets current industry standards and legislative requirements in order to: • Avoid or minimise waste generation where practicable, followed by reuse and recycling where reasonable and feasible. Waste avoidance and reuse strategies employed by the Mine will include: - Purchase and use of products that generate minimal waste (including packaging) and pollution; - Purchase and use of materials that may be less toxic or hazardous, or that can be reused, recycled or more readily disposed of; and	Commencement of the Project

Ref#	Factor	Management and Mitigation Measures	Timing
		- Consideration of opportunities for material reuse when purchasing resources from suppliers and during equipment procurement. • Confirm that waste that cannot be reused or recycled will be disposed of at an appropriate licensed facility by waste contractors; • Avoid unnecessary resource consumption by making realistic and accurate predictions on the required quantities of resources such as construction materials; • Separate wastes generated by the proposed development prior to disposal by licensed contractors; • To where practicable, mulch green wastes onsite and reuse for landscaping in the absence of a more beneficial use being identified (such as harvestable timber or fence posts); • Store hazardous wastes in secure areas on site within areas that have adequate bunding and containment measures to minimise the potential for spillages and leakages; • Store waste oil and other flammable waste streams at locations away from any likely ignition sources; and • Track wastes and confirm that these are being transported and disposed of in accordance with the Protection of the Environment (Waste) Regulation *2005* and the POEO Act.	
24.5.2	Waste Management	The Waste Management Procedure will be included in the CEMP for the construction of the cut and cover tunnel as well as for the operation of the Mine.	Commencement of the Project
Rehabilitation			
25.6.1	Infrastructure Areas	During the decommissioning phase should contaminated, carbonaceous or material unsuitable for rehabilitation be identified, it will be stripped and buried either in the final stages of capping of the tailings storage facility or disposed of and covered in the floor of the final void. Where possible, the material will be considered for reprocessing before the CHPP is decommissioned.	Following the closure of the Mine
25.6.2	Infrastructure Areas	Surface water management structures (contour banks, drains and settlement ponds) will be constructed, where required.	Duration of the Project
25.6.3	Infrastructure Areas	A light vehicle access road is to be maintained to enable inspections of the site following closure of the Mine.	Following the closure of the Mine
25.6.4	Infrastructure Areas	The proposed and existing cut and cover tunnels under the New England Highway will be partially filled, allowing post mining access under the highway for cattle.	Following the closure of the Mine
25.6.5	Water Management Areas	Water run-off from the rehabilitated landform will be directed into ephemeral channels that flow into the existing drainage pattern around the mine. Temporary sediment controls such as the use of gabions, geotextiles, hay bales, sediment control fencing techniques, and other techniques used during Mine life, may be integrated with vegetation and permanent	Duration of the Project

Ref#	Factor	Management and Mitigation Measures	Timing
		engineering strategies to achieve stability in relevant areas.	
25.6.6	Water Management Areas	Where appropriate the water storage dams will be incorporated into the landscape with a view to supplying watering points for cattle. These dams will be revegetated with plant species (e.g. grass species and emergent reeds) suitable to ensure stability of the dam wall and batters, whilst also providing potential localised habitat for native fauna. This will be further enhanced by the incorporation at a landscape level of large woody debris and or localised rock stockpiles. The drainage pattern of the final landform will be designed to integrate with the surrounding catchments and will be revegetated to achieve long term stability and erosion control.	Duration of the Project and following the closure of the Mine
25.6.7	Tailings Emplacement Area	Pit 1 tailings emplacement (tailings emplacement #4) is the only active tailings emplacement planned during the life of the Project. Even though co disposal will be the preferred disposal technique, this area will be maintained for the purpose of backup for tailings management. The tailings emplacement areas will be left for an appropriate period following last disposal for drying prior to rehabilitation. The tailings emplacement areas will be capped and revegetated with a species mix aligned to the land use.	Duration of the Project
25.6.8	Overburden Emplacement Areas	Overburden emplacement areas will be designed so that: • Overburden emplacement capacity is aligned to the final landform design where possible; • The visual impacts of the existing area adjacent to the New England Highway are reduced; • Hazards that the site may pose to unauthorised people who access the area are considered (safety considerations are included); • Runoff water quality is similar to undisturbed lands and will not degrade receiving streams; • The rehabilitated overburden emplacement area will be revegetated with species aligned to the post mining landform and land uses; and • The rehabilitated overburden emplacement area landform will be compatible with the surrounding countryside.	Duration of the Project
25.6.9	Rehabilitated Lands	A Mining Operation Plan will substitute for the Rehabilitation Management Plan and will be developed and implemented for the ongoing management of rehabilitation activities at the Mine including aims, objectives and methodologies.	Duration of the Project
25.6.10	Rehabilitated Lands	The mined lands will be rehabilitated back to pasture and areas of trees over grass. The proposed final landform will be consistent with the surrounding natural landscape.	Following the closure of the Mine
25.6.11	Final Void	The low wall slopes of the final void landform will be designed with an overall slope of around 18 degrees. Design alternatives for the final void will continually be evaluated and will be prepared as part of the closure planning process.	Duration of the Project
25.6.12	Unmined Land	The buffer lands are to be managed to enhance land use values during and after the life of the Project. The management of these lands will require:	Duration of the Project

Ref#	Factor	Management and Mitigation Measures	Timing
		• Corridor management in context of grazing and biodiversity; • Fencing and access control; • Weed and vertebrate pest species management and control; • Track construction and maintenance; • Strategic grazing and stock control; and • Bushfire management.	
25.6.13	Growing Media Development	Sodic soils to be used as a growing media will be treated with ameliorants with these materials being incorporated into the topsoil profile. Sodic subsoils where exposed, will be managed with appropriate erosion and sediment control structures in place (contour banks, sediment retention ponds, rock armouring etc.). Topsoil will be used as a first priority, but where topsoil is not been available in sufficient volumes, biosolids and biosolids/mulch mix may be used to improve soil structure and act as a source of nutrients.	Duration of the Project
25.6.14	Ecosystem and Land use Establishment	Land use disturbance will be minimised by clearing the smallest practical area of land at any one time and leaving it exposed for the shortest possible time. The proposed use of felled vegetation may include the collection of timber for fencing; incorporating ground cover, understorey species and saplings into stripped topsoil; respreading large woody debris onto re-contoured land; and installation of stag trees as potential habitat and refuge for avian and arboreal fauna.	Duration of the Project
25.6.15	Ecosystem and Land use Establishment	All noxious weeds are to be managed and controlled as per the requirements of the Noxious Weeds Act 1993. A feral animal management and control program will be conducted annually across the Mine. All work will be implemented in close liaison with the staff of the Local Land Services and in close communication with adjoining land users to ensure a coordinated approach to pest management.	Duration of the Project
25.6.16	Ecosystem and Land use Sustainability	Maintenance works will be implemented for pasture growth including: • Soil sampling for the purpose of defining fertiliser and seeding regimes; • Application of defined fertiliser – in terms of rates and mix; and • Over sowing of pasture with legumes.	Duration of the Project
25.6.17	Monitoring Program	All rehabilitated areas will be inspected to identify any areas requiring maintenance or further treatment. Remedial works will then be scheduled to address these areas as set out in the Rehabilitation Strategy.	Duration of the Project

Ref#	Factor	Management and Mitigation Measures	Timing
25.6.18	Monitoring Program	Where appropriate, the rehabilitation procedures will be amended to improve the standard of rehabilitation. Parameters that will be assessed as part of the monitoring program will include: • Landform; • Drainage; • Surface preparation; • Vegetation establishment and development; • Carrying capacity and stocking rates via pasture productivity assessment; • Weeds and feral animals; • Nutrient cycling; • Soils/surface condition; • Land and soil capability; and • Erosion and stability.	Duration of the Project

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9.0 Conclusion and Next Steps

During public exhibition of the EIS for the Project, 140 submissions were made, including eight from Government agencies, one from Singleton Council, 16 from special interest groups or organisations, and 115 from individual community members. Of the 115 community submissions received, more than two thirds (79) were in support of the Project, and less than one third (36) raised objections to the Project.

This RRTS Report has provided additional information to address the issues raised in the submissions relating to the groundwater modelling, water licensing, air quality assessment, remapping of vegetation communities, recalculation of biodiversity offset credits, potential flooding impacts, noise impacts, and economic assessment. This has included a response to requested clarifications from government agencies and the DP&E received outside of the EIS exhibition period.

This RRTS Report has assessed potential impacts of the Project in regards to biodiversity and has considered avoiding and mitigation of biodiversity impacts to the New Disturbance Area, and offsetting where impacts could not be avoided. Offset credit calculations have been determined of the Project under the UHSA (BCAM) methodology which identified that 3,893 credits would be required. If the UHSA does not proceed, offset credits have also been calculated under the FBA methodology which calculated that 5,455 credits would be required under that system. The calculation of credit requirements under both systems provides the Project with a fall-back offsetting mechanism should the UHSA not proceed. Furthermore the development of an offsetting strategy as provided with this RRTS identified the steps Bloomfield would take to purchase, retire, identify offsetting sites or pay into the Biodiversity Conservation Trust to meet the Projects offsetting requirements.

The review of the agricultural production potential of the 41ha area not previously assessed concluded that based on 2015 cattle prices the removal of the 41ha area from grazing would potentially result in a loss of $10,879 per year. This loss in production is considered negligible in the context of the Project and its resulting economic benefits. Regardless Bloomfield intends to continue to maintain its rehabilitation strategy and return appropriate areas to grazing following the completion of mining. This would further reduce and potentially offset the loss of grazing land as a result of the Project.

This RRTS has demonstrated that the entire Project Area including the New disturbance Area, areas previously approved for disturbance and additional areas proposed to be disturbed by the Project have been subject to a comprehensive environmental Assessment. A review of the management measures included in the EIS and original Response to Submissions Report has been included in the RRTS. This review concluded that the management measures as previously proposed would continue to apply to the Project. Where required additional management measures have been recommended to ensure an appropriate level of environmental management is provided by the Project.

Additional questions raised by the DP&E and other agencies subsequent to the submission of the original Response to Submissions Report have also been addressed in this RRTS. It is considered that the information previously provided in the EIS and this RRTS report have adequately addressed all remaining assessment requirements for the project.

The DP&E will now assess the Project in consultation with other relevant agencies, and the assessment process will include review of the EIS and this RRTS Report. The DP&E will then prepare a draft assessment report for consideration by the Minister for Planning or his delegate. The Minister for Planning has delegated his role in the determination of coal mine projects to a PAC. Therefore, the Project will be referred to the PAC, and the PAC will review the assessment and provide a determination on the Project.

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10.0 References

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