



The Coordinator-General



# **Bowen Basin Coal Growth Project: Caval Ridge Mine**

## **Coordinator-General's evaluation report for an environmental impact statement**

**August 2010**



# Caval Ridge Mine

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# Coordinator-General's report synopsis

## Introduction

This Coordinator-General's report provides an evaluation of the environmental impact statement (EIS) and potential impacts of the Caval Ridge Mine (CRM). It has been prepared pursuant to section 35 of *State Development and Public Works Organisation Act 1971* (Queensland) (SDPWO Act).

The Department of Infrastructure and Planning (DIP) managed the impact assessment process for the CRM on my behalf in accordance with the SDPWO Act.

## The proposal

The proponent for the CRM is BHP Billiton Mitsubishi Alliance Coal Operations Pty Ltd (BMA).

The CRM is the second component of the Bowen Basin Coal Growth project (BBCG project). The four key components of the BBCG project are:

- the new open cut CRM (which is the subject of this report)
- a new open cut Daunia Mine (for which a Coordinator-General's EIS evaluation report was completed on 26 October 2009)
- a large expansion of the existing open cut and underground Goonyella Riverside Mine
- construction of a new larger capacity airport in the vicinity of Moranbah.

The CRM is proposed to be located north of the existing Peak Downs Mine, six kilometres south of Moranbah, in Central Queensland (Figure 1, Project location), and includes the following key elements:

- it is located in the northern section of the existing Mining Lease ML1775
- requirement for a new mining lease, on an area subject to a Mining Lease Application (MLA70403) to the west of ML1775, for site infrastructure and out-of-pit spoil dumps
- production up to approximately 5.5 million tonnes per annum (Mtpa) of coal products
- a construction workforce of approximately 1200 people, with an estimated operating workforce of 495 people
- open cut coal mining undertaken by dragline and truck and shovel
- development of associated infrastructure including a new 8 Mtpa coal handling and preparation plant (CHPP) which would also process approximately 2.5 Mtpa sourced from the existing Peak Downs Mine, and a new water pipeline connection
- overland conveyor constructed from the southern run-of-mine pile to the Caval Ridge CHPP to transfer the additional coal mined at Peak Downs
- a tailings belt press filter dewatering technique incorporated into the CHPP
- elevation of the Peak Downs Highway over a new mine haul road and infrastructure corridor
- construction of a new rail spur and loop from the main Blair Athol line to the train load-out facility.



BMA expects construction capital expenditure of approximately \$4 billion over 25 months and operational expenditure of approximately \$475 million per year over a mine life of approximately 30 years.

## The EIS assessment process

The BBCG project was declared to be a 'significant project for which an EIS is required' under section 26(1)(a) of the SDPWO Act, on 22 July 2008.

On 23 September 2008, the Commonwealth Minister for the Environment, Heritage and the Arts determined that the CRM was a 'controlled action' pursuant to section 75 of the *Environmental Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act) - reference number EPBC 2008/4417. The controlling provisions are sections 18 and 18A (listed threatened species and communities) of the EPBC Act. Under the '*Bilateral Agreement between the Australian Government and Queensland*' (the Bilateral Agreement'), this Coordinator-General's report will be used by the Commonwealth Minister for the Environment, Heritage and the Arts to make an assessment of the controlled action for the purposes of the EPBC Act.

The draft terms of reference (TOR) for the EIS for the BBCG project were advertised for public comment on 9 August 2008. Comments were accepted until close of business on 5 September 2008. A final TOR was issued to the proponent in November 2008.

The EIS for the CRM was released for public and advisory agency comment from 11 July 2009 to 24 August 2009. A total of 467 submissions were received in response to the EIS. The substantive issues raised in submissions during the EIS process related to:

- air quality and dust emissions
- vegetation offsets for clearing of endangered ecological communities
- tailings storage and treatment
- social impacts such as pressure on housing and a range of community services, amenity impacts on Moranbah resulting from increased traffic, dust, noise and vibration, and the cumulative consequences of these matters arising from other BBCG project components and other proposed mine developments in the area.

A supplementary EIS (SEIS), which addressed agency and public submissions on the EIS, was made available for agency comment and public submitter viewing from 13 November 2009 to 14 December 2009.

In undertaking my evaluation, **I have considered** the EIS, relevant issues raised in submissions on the EIS, the SEIS, submissions on the SEIS and any other material that I deemed as relevant to the CRM and the BBCG, and advice from advisory agencies and other entities, technical reports and legal advice.

This report includes an assessment and conclusions about the environmental, social and economic impacts of the CRM and associated mitigation measures.

## Summary of key issues

### Land resources

**I have sought clarification** on the issues of potential tenure conflict and coal resource sterilisation. **I note** that a long-standing tenure dispute between Cherwell Creek Coal Pty Ltd and BMA was resolved when the *Mineral Resources (Peak Downs Mine) Amendment Act 2008* came into force. The Department of Employment, Economic Development and Innovation (DEEDI) has advised that the limited extent of sterilisation of coal on MLA70403 that may be caused by the CRM is considered acceptable to QME and that the most appropriate use of the land subject to Cherwell Creek Coal's application for MDLA364 would be for infrastructure to support the proposed CRM. DEEDI also advised that there be no

special conditions in this report with respect to resource sterilisation and there is no reason related to resource sterilisation that should prevent me from finalising this report.

With respect to the visual impacts of the project, **I recommend** that:

- The results of the proposed mitigation strategies outlined in the draft Environmental Management (EM) plan be monitored by BMA in consultation with the Isaac Regional Council (IRC) throughout the life of the mine, and those strategies be enhanced wherever they are considered to have insufficiently reduced the visual impacts, as viewed from key viewpoints on the Peak Downs Highway, the Moranbah Access Road and Moranbah.
- BMA achieves a minimum average of 30 per cent revegetation of all elevated spoil areas that are visible from key viewpoints on the Peak Downs Highway, the Moranbah Access Road and Moranbah (excluding tourist lookouts established as part of the project) within three years of completion of placement of spoil in those areas.

There is increasing community concern that the expansion of the coal mining and coal seam gas development in Queensland is resulting in the alienation of productive agricultural land. BMA provided information in relation to agricultural land classification for the CRM site. **I find** that the removal of this land would not significantly compromise the surrounding grazing land and the rural industry of the region so it does not need to be offset or mitigated. As the area around Moranbah is not used significantly for cropping, my decision does not provide a precedent for the assessment of the impact of mining on strategic cropping land in other parts of Queensland.

BMA is to prepare a post-closure management plan, for rehabilitation of the final void and landform management, which must have provision for monitoring of surface and groundwater quality, seepage rates, erosion, the integrity of rehabilitation and the health of vegetative cover.

## Mineral waste

**I am satisfied** that the mineral waste that would be generated by the CRM has been sufficiently characterised. **I am also satisfied** that, subject to resolution of the matters related to tailings dewatering, the mineral waste management strategy and the associated monitoring of mineral wastes proposed for the EM plan will ensure appropriate disposal and management of the mineral wastes of the CRM.

BMA proposes to use a belt filter press system to dewater the tailings from the CHPP. However, the Department of Environment and Resource Management (DERM) is concerned about the reliability of this technology. **I require** the proponent to provide sufficient evidence to justify the effectiveness and reliability of the proposed belt filter press technology and **I require** the proponent to demonstrate that there is sufficient space on site to construct a conventional tailings storage facility as a contingency should the belt filter press not work as intended or produce an unacceptably fluid residue.

**I consider** that the spoil management measures described in the SEIS, combined with the proposed EA conditions should be sufficient to achieve acceptable environmental outcomes with respect to CRM spoil rehabilitation.

## Surface water resources

Further information needs to be provided by BMA to DERM on the proposed Cherwell and Caval Creek diversion designs before the Environmental Authority (EA) can be issued.

**I am satisfied** that the draft EA conditions provided in Schedule 3, Appendix 1 of this report will ensure:

- the suitable preparation, implementation and ongoing review of the CRM water management system
- that the CRM dams are appropriately located, designed, constructed and operated to avoid causing environmental harm.



**I consider** that BMA's commitment to develop and implement a water supply strategy and emergency plan should adequately mitigate the risk of inadequate water supply and **I impose** a condition that requires the development of this plan.

BMA has proposed a CRM water management system that involves controlled releases from the CRM to Cherwell Creek under conditions that are outside of the *Final model water conditions for coal mines in the Fitzroy Basin (July 2009)*.

Following extensive discussions and the submission of additional studies by BMA, **I state**, in consultation with DERM, draft EA conditions that require the electrical conductivity (salinity) of the discharge water to be limited to 1000 microsiemens per centimetre ( $\mu\text{S}/\text{cm}$ ), and a minimum acceptable receiving water flow rate of 0.5 cubic metres per second. However, DERM considers that there may be scope for raising the limit to 1500  $\mu\text{S}/\text{cm}$ , subject to BMA assessing how the increase would impact on the environment and committing to satisfactory environmental protection measures. Furthermore, DERM is prepared to consider BMA's proposal of an 1800  $\mu\text{S}/\text{cm}$  discharge limit, subject to BMA providing a sufficiently detailed technical business case.

**I impose** a condition requiring that, prior to issuing the EA, DERM approves any design of the CRM operational flood protection levees to be sure that those structures can be adequately accommodated within the available space of the CRM mining leases.

**I impose** a condition that requires BMA to consider risks associated with floods up to a probable maximum flood event as part of closure design for the CRM.

## Groundwater resources

In consultation with DERM, **I state** a condition requiring that a revised final void model be prepared for approval by DERM five years after commencement of operation of the CRM and this be subject to review each five years thereafter based on any changes to groundwater or other relevant data that becomes available from the groundwater monitoring program.

**I accept** that there is limited likelihood that the CRM will have a negative impact on the quantity or quality of bore water supply to surrounding users. Nonetheless, **I state** a condition on the mining lease requiring BMA to compensate groundwater users if monitoring demonstrates that an impact is occurring.

## Ecology (terrestrial and aquatic)

The CRM would require the clearing of approximately 779 hectares of native vegetation, much of which is 'not of concern' or in a degraded condition and some of which requires offsetting. BMA has existing approvals for clearing of the Peak Downs Mine site, which lessens the approval and offset requirements for the CRM.

**I have determined** that the total areas of regional ecosystems (REs) to be unavoidably cleared which requires offsets under state and/or Commonwealth legislation are:

- poplar box woodlands— treated as 'of concern' - 113 hectares
- brigalow woodlands— treated as 'endangered' - 21 hectares
- natural grasslands— treated as 'endangered' - 125 hectares

In consideration of the size, location, ecological integrity, protection status, local/regional significance and connectivity of REs proposed to be cleared for the CRM, **I recommend** that the following minimum offset ratios apply to the CRM:

- zero offsets for 'least concern' REs
- 1:2 offsets for 'of concern' REs
- 1:3 offsets for 'endangered' REs and endangered ecological communities under the EPBC Act.

**I further consider** that these ratios would need to be increased as the ecological integrity, protection status, contiguity, RE similarity and connectivity of proposed offset decreased and as the distance of the offset from the CRM increased.



**I recommend** minimum offset areas totalling approximately 724 hectares that should apply to the CRM.

With respect to the draft Biodiversity Offset Strategy prepared by BMA still to be formally considered by DERM, **I consider** that the proposed red gum, poplar box and brigalow woodlands offset strategies are acceptable, but the proposed natural grassland strategy is unacceptable.

BMA's offset strategy will also be considered by the Commonwealth Minister for the Environment, Heritage and the Arts in the assessment of the CRM as a controlled action under the EPBC Act.

**I am satisfied** that the EIS, SEIS and EM plan adequately address potential impacts to native fauna, including koalas, EPBC-listed significant species and migratory species. **I am satisfied** that the proposed mitigation measures and fauna monitoring will reduce the impacts on fauna as a result of construction and operation activities. Nonetheless, **I impose** a condition requiring BMA prepare to the satisfaction of DERM and DEWHA a 'Threatened Flora and Fauna Species and Ecological Communities Management Plan' that ensures the impacts to these species and communities are minimised, contributes to the survival of these species in the wild, and achieves conservation benefits for these species and communities where practicable..

**I consider** that the potential direct impacts to aquatic species and habitats on the CRM site are not significant and that proposed mitigation measures, in combination with rehabilitation of the disturbed areas and surface water controls proposed, are sufficient to minimise and mitigate any potential impacts on aquatic species and habitats on the CRM site and downstream. However, to ensure that any disturbance of watercourses and aquatic ecology is minimised, **I state** a condition that requires BMA to develop and implement a 'Watercourse Revegetation Plan' for creek diversions, undertake monitoring of aquatic ecology and maintain environmental flows as required.

**I am satisfied** that the measures proposed in the EIS, the commitments made by BMA, and the proposed EA conditions and my imposed conditions are sufficient to mitigate and manage any potential adverse impacts associated with pest plants and animals associated with the CRM.

## Air quality

Dust generation by the CRM and the cumulative impacts of this with other mining projects on air quality in Moranbah has been a key concern in submissions received during the EIS process.

Based upon Queensland Health advice about potential human health impacts, **I consider** that the *Environmental Protection (Air) Policy 2008* (EPP (Air) objective of 50 micrograms per cubic metre ( $\mu\text{g}/\text{m}^3$ ) and five allowable exceedences per annum for 24 hour average concentration of airborne particulate matter with a diameter less than ten micrometres ( $\text{PM}_{10}$ ), should be a key element of air quality management applied to the CRM, with the aim of achieving this level in the long term. To reduce the risk of air quality impacts on sensitive receptors, but to provide some reasonable management flexibility to BMA to achieve the EPP (Air) requirements, in consultation with DERM, **I state** conditions for the EA for the CRM that allow BMA a choice of either:

- adhering strictly to the 50  $\mu\text{g}/\text{m}^3$   $\text{PM}_{10}$  limit, or
- adopting 'high management control measures' on days where meteorological conditions indicate that the 50  $\mu\text{g}/\text{m}^3$   $\text{PM}_{10}$  limit is likely to be exceeded if additional changes to mine management practices are not implemented.

As the second option is being used for the first time in Queensland, I also impose a condition which requires a review of that approach after 24 months operation of the CRM.

While **I am satisfied** that BMA's proposed monitoring program will provide sufficient air quality information for the CRM, the conditions **I impose** and the EA conditions that **I state** in consultation with DERM will allow that program to be reviewed and improved.



**I commend** BMA's voluntary initiative of instigating monitoring of air quality in the town of Moranbah and **I emphasise** that the results from the proposed town monitoring station are independent of the CRM air quality monitoring program and EA conditions. Nonetheless, I consider the town monitoring to be an understandable response to concerns raised by Moranbah residents, so **I impose** a condition requiring a reasonable reporting period for the town monitoring and I recommend that BMA work with other key stakeholders to create an integrated air quality monitoring system for Moranbah.

## Noise and vibration

Some submissions on the EIS raised concerns about the potential impacts of mine blasting vibration on the structural integrity of buildings in the town.

Modelling undertaken by BMA predicts that noise from the CRM would be exceeded at only two privately owned locations and that ground vibration goals would not be exceeded.

**I am satisfied** that measures committed to by BMA and included in conditions on the EA that **I state** in consultation with DERM will sufficiently address noise and vibration impacts of the CRM.

## Transport and traffic

The layout of the CRM crosses the Peak Downs Highway south of Moranbah and BMA has committed to elevate the highway on the existing horizontal alignment, with a new underpass for mine infrastructure.

**I am satisfied** that BMA has adequately addressed the impacts of the CRM on the local and state-controlled road networks in the vicinity of the mine, during both construction and operation.

BMA and the Department of Transport and Main Roads (TMR) are developing an Infrastructure Agreement to address the funding, construction and maintenance of key infrastructure identified for the CRM that impact upon the state-controlled road network. An Infrastructure Agreement will also be required between BMA and IRC to address impacts upon the local road network.

To support these Infrastructure Agreements, I have imposed conditions requiring:

- road use management plans (RMPs), further work on road impact assessments, the transport of workers between the mine and accommodation village(s), the coordination of upgrading works at the Peak Downs Highway / Moranbah Access Road intersection, and adequate consultation with TMR, IRC and the Queensland Police Service (QPS) prior to obtaining the necessary permits for excess mass or over-dimension loads
- that the infrastructure agreements address the proposed Peak Downs Highway vertical realignment and underpass of CRM services, the design requirements of TMR and IRC for road intersection upgrades, the need for suitable stock route access to the Peak Downs Highway, and maintenance impacts of the CRM on state-controlled roads and local government roads where more detailed traffic assessments indicate that this is warranted.

## Cultural heritage

BMA has prepared a cultural heritage management plan (CHMP) for the CRM, which is a mandatory requirement under the *Aboriginal Cultural Heritage Act 2000*. The BaradaBarna traditional owners, who are the registered Native Title claimants and BMA signed the CHMP, at a formal ceremony on 3 June 2010.

**I am satisfied** that the measures described in the EIS, SEIS, EM plan and the CHMP are sufficient to identify significant cultural heritage places and artefacts affected by the CRM, and mitigate and manage the potential low level adverse impacts to indigenous and non-indigenous cultural heritage that have been identified.

## Social impacts

A majority of submissions on the EIS raised concerns about either direct social impacts of the CRM or impacts on living amenity matters such as dust, noise, vibration and traffic. In response to both these concerns, and the findings of the EIS, a robust community liaison, communications and complaints response system is justified. Therefore, **I have imposed** conditions which prescribe in detail:

- BMA's overall CRM communication responsibilities
- the establishment and operation of a community liaison group to be known as the 'Moranbah BMA Community Network'.

**I impose** a condition requiring BMA to develop a Social Impact Management Plan (SIMP), in consultation with the DIP Social Impact Assessment Unit and the Moranbah BMA Community Network, to address cumulative impacts, housing and accommodation issues, community health, safety and wellbeing, social infrastructure, workforce matters, employment and economic development, indigenous engagement, and stakeholder engagement.

**I consider** that:

- the new Whitsunday Hinterland and Mackay (WHAM) Statutory Regional Plan will provide the principal planning tool to address the cumulative impact issues of coal mining facing the Isaac Regional Council area
- it is important that all mining proponents in the WHAM planning region fully participate in the development of the new WHAM statutory regional plan.

Therefore, **I recommend** that the IRC and DIP jointly lead a study to identify the cumulative social impacts of mining in the Isaac Region local government area and the mitigation measures and social infrastructure required to address those impacts.

In accordance with BMA's significant role in coal mining in the Isaac Region, **I impose** a condition that requires BMA to:

- participate in the study of cumulative social impacts of mining in the Isaac Region local government area
- contribute information about all of its operations in the Isaac region
- contribute \$150 000 to the cost of the study
- collaborate with the state and local government agencies and other resource industry stakeholders in the study and in the development of cumulative social impact mitigation and management strategies in line with the findings of the study and the outcomes of the WHAM statutory plan.

It is Queensland Government policy that project proponents are also responsible for mitigating any adverse accommodation and housing impacts as a result of resource projects.

**I consider** that the CRM will have a significant impact on housing cost and availability in Moranbah, even though BMA's operational workforce strategy is for a 70 per cent fly-in-fly-out (FIFO) operational workforce to be accommodated in workers village(s).

**I accept** BMA's proposal to accommodate 100 per cent of its construction workforce in accommodation villages, initially at the Denham Village site on ML1775 and then at another location yet to be identified that will be subject to a future application for approval. **I impose** a conditions requiring BMA to provide new dwellings in Moranbah for any new construction personnel living there if the number of such workers exceeds one per cent of the forecast peak CRM construction workforce.

**I accept** BMA's proposal to accommodate 70 per cent of its operational workforce in accommodation village(s). However, **I conclude** that:

- this acceptance should not be considered to set a precedent for future phases of the BBCG project



- while current evidence is that it may not be prudent to support a FIFO strategy of greater than 70 per cent of the operational workforce for the CRM, any such future proposal would need to be assessed on its merits at the time.

**I impose** a condition requiring BMA to honour its commitment to provide new dwellings in Moranbah to accommodate all new CRM operational personnel and their families living outside of an accommodation village.

**I conclude** that the EIS documents do not present sufficient data to enable an adequate quantification of the impacts of the CRM on broader housing market in Moranbah. Therefore, **I impose** a condition that requires BMA to engage the Office of Economic and Statistical Research to undertake a “*BBCG Project Housing Impacts Study*”, and then subsequently to present a “*BBCG Project Housing Impact Plan*” for approval by the Coordinator-General. Recommendations of the approved plan would be incorporated into the CRM SIMP and may be incorporated as conditions of future BBCG Coordinator-General’s EIS Assessment Reports or relevant Change Reports.

**I recognise** that social infrastructure plays a pivotal role in supporting better community health, safety, and wellbeing outcomes. Therefore, **I recommend** that:

- BMA works closely with its Community Network, the Bowen Basin Local Leadership Group and the Queensland Government Central Queensland Regional Managers Coordination Network to prioritise social infrastructure needs in the CRM study area, and
- strategies to address these priorities be detailed in the CRM SIMP.

**I impose** conditions that require BMA to address road safety matters raised by the QPS and fulfil its undertakings with respect to community safety matters and include and monitor them in the SIMP.

**I commend** BMA for demonstrating leadership in its commitment to workplace diversity. **I impose** a condition that requires BMA workforce behaviour standards to be incorporated into the CRM SIMP, and **I recommend** that BMA engage further with key stakeholders on these matters.

**I commend** BMA for its supply practices and for auditing its operations with respect to buying and investing locally and supporting local businesses. **I recommend** that any outcomes of a BMA audit that identify local business opportunities be incorporated into the CRM SIMP.

**I impose** a condition that requires BMA to include its Indigenous Engagement Strategy and specific details about its commitment to Indigenous employment, business/enterprise, and training opportunities and monitoring and review mechanisms relating to these business objectives in the CRM SIMP.

## Workforce accommodation villages

**I note** that BMA will require new development approvals for its workers village(s) for the CRM and that sufficient information to allow the assessment of this aspect of the project was not provided during the EIS process for the CRM. **I impose** a condition that requires BMA to subject any new accommodation village proposal for the CRM for assessment as part of this significant project for the BBCG project under Part 4 of the SDPWO Act.

To ensure that the impacts associated with the construction workforce accommodation villages can be adequately mitigated, **I impose** a condition that requires BMA to provide sufficient construction camp accommodation capacity at each stage of the CRM development.

**I recommend** that capacity planning for operational worker villages for the BBCG project allow for the periodic accommodation needs of visiting maintenance personnel (such as the large dragline overhaul crews) and I make a recommendation about the decommissioning of the proposed Denham Village camp.

**I impose** a condition that requires traffic management plans and RMPs be approved by TMR and/or IRC before construction of any accommodation village may commence.

## Greenhouse

I **consider** that it would not be reasonable at this stage to impose a definitive offset requirement on the construction and operation phase of a high-volume commodity production project such as the CRM. To mitigate the carbon footprint for both the construction and operation phases of the CRM, I **impose** a condition that requires BMA to develop and implement a greenhouse gas management plan in relation to the Scope 1 and Scope 2 emissions of the CRM.

## Potential resource tax

The evaluation and consequent conditions in this report have been undertaken on the basis that there is currently no mineral resources rental tax as recently announced by the Australian Government. If a tax is introduced and revenues from it are used to provide project infrastructure or services which have been required to be funded as a condition stated or imposed in this report, then BMA may submit a request for project condition change.

## Environmental management plan

BMA has committed to the management of potential impacts of the CRM through the implementation of an EM plan and I **am confident** that, subject to the measures specified in this report, the draft EM plan will provide the mechanism to adequately manage and monitor the potential environmental impacts of the CRM.

## Matters of national environmental significance

This report provides a review of the extent to which the material supplied by BMA as part of the EIS process addresses the actual or likely impacts of the CRM on each of the matters protected by the controlling provisions under the EPBC Act.

I am satisfied that the EIS process conducted for the CRM adequately meets the requirements for impact assessment, to the greatest extent practicable, in accordance with the provisions of Part 4 of the SDPWO Act and Part 5 of the *State Development and Public Works Organisation Regulation 1999* (the Regulation), as specified in Schedule 1 (Item 2, Class 2) of the Bilateral Agreement.

This report will be provided to the Australian Government Minister for the Environment, Heritage and the Arts pursuant to section 17(2) of the Regulation, to enable a decision on the controlled actions for the CRM pursuant to section 133 of the EPBC Act.

## State approvals

This report has been prepared to cover the CRM related activities on ML1775, and provide for a new mining lease, on an area subject to MLA70403. Accordingly, pursuant to section 49(1) of the SDPWO Act, I **state conditions** that may be attached to the EA (mining lease), for the CRM, which are contained in Schedule 3, Appendix 1 of this report. In accordance with section 49(2) of the SDPWO Act, I will give a copy of this report to the Queensland Minister administering the *Environmental Protection Act 1994* (EP Act) for advice in consideration of the Minister's decision on the EA for the CRM.

There are no conditions stated in this report directly on the mining leases under section 45 of the SDPWO Act.

I **impose** conditions under section 54(B) of the SDPWO Act in Schedule 1, Appendix 1 of this report for matters associated with the CRM or the BBCG project that are off the mining leases and/or for which there are no powers to set conditions under the EP Act or the *Sustainable Planning Act 2009*. I **nominate** the responsible entities for those imposed conditions in Schedule 2, Appendix 1 of this report.



**I recommend conditions** for other approvals in Schedule 4, Appendix 1 of this report in accordance with section 52 of the SDPWO Act.

**I also make general recommendations** for the consideration of the proponent and other nominated entities, which are contained in Schedule 5, Appendix 1 of this report.

## Conclusion

**I am satisfied** that the environmental impact assessment requirements of the SDPWO Act for the CRM have been satisfactorily fulfilled and that sufficient information has been provided to enable me to finalise the required evaluation of the potential impacts attributable to the mine.

**I consider** that there would be significant local, regional, state and national economic benefits to be derived from the proposed CRM, and that any negative environmental or social impacts of the CRM can be acceptably managed by the implementation of the measures described in this report. Conditions and recommendations proposed in this report have been formulated in order to further manage impacts to social, environmental and economic values through EA and Coordinator-General imposed conditions and other policy, regulatory and licence arrangements.

Therefore, pursuant to section 35 of the SDPWO Act, **I recommend** that the CRM, as described in detail in the EIS and SEIS, summarised in section 2 of this report and as supplemented or modified by Appendices 2-5 of this report, can proceed, subject to the conditions and recommendations contained in Appendix 1 of this report.

.....  
**Geoff Dickie**  
**Coordinator-General**

Date: 9 August 2010

# 1. Introduction

This Coordinator-General's report provides an evaluation of the environmental impact statement (EIS) and potential impacts of the Caval Ridge Mine (CRM), which is a component of the overall Bowen Basin Coal Growth project (BBCG project). It has been prepared pursuant to section 35 of *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act).

The Department of Infrastructure and Planning (DIP) is managing the impact assessment process for the BBCG project on my behalf in accordance with the SDPWO Act.

The proponent for the project is BHP Billiton Mitsubishi Alliance Coal Operations Pty Ltd (BMA). The EIS process was conducted by BMA and the EIS documentation was prepared on BMA's behalf by its principal consultant, URS.

An initial advice statement (IAS) for the BBCG project was lodged with the Coordinator-General on 27 May 2008 and the BBCG project was declared to be a 'significant project for which an EIS is required' under section 26(1)(a) of the SDPWO Act, on 18 July 2008.

On 23 September 2008, the Australian Government Minister for Environment Protection, Heritage and the Arts determined that the CRM was a 'controlled action' pursuant to section 75 of the *Environmental Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act)—reference number EPBC 2008/4417—and therefore assessment by the Australian Government Department of the Environment, Water, Heritage and the Arts (DEWHA) was required. Under the bilateral agreement between the Australian Government and the State of Queensland, this Coordinator-General's report will be used by the Australian Government Minister or delegate to make an assessment of the controlled action.

The objective of this report is to evaluate the key issues associated with the potential impacts of the CRM on the physical, social and economic environments at the local, regional, state and national levels. It is not intended to record all the matters that were identified and subsequently settled. Instead, it concentrates on the substantive issues identified during the EIS process.

In undertaking my evaluation, I have considered the EIS, issues raised in submissions relating to the EIS, the supplementary EIS (SEIS), properly made submissions and other submissions that I have accepted, and any other material that I deemed as relevant to the CRM, such as comments and advice from advisory agencies and other entities, technical reports and legal advice.

The evaluation and consequent conditions in this report have been undertaken on the basis that there is currently no mineral resources rental tax as recently announced by the Australian Government. If a tax is introduced and revenues from it are used to provide project infrastructure or services which have been required to be funded as a condition stated or imposed in this report, then the proponent may submit a request for project condition change.

In Appendix 1 of this report I **impose** (Schedule 1), **state** (Schedule 3) and **recommend** (Schedule 4) conditions under which the CRM may proceed, and make general recommendations (Schedule 5).

Acronyms and other key terms used in this report are defined in Schedule 6 of Appendix 1 of this report.



## 2. Project description

### 2.1 The proponent

The BBCG project proponent is BMA as manager and agent on behalf of the Central Queensland Coal Associates (CQCA) Joint Venture joint venture between BHP Billiton (50 per cent) and Mitsubishi Corporation (50 per cent). The unincorporated joint venture arrangements are regulated in accordance with the CQCA Joint Venture Agreement as amended most recently by deed dated 28 June 2001 and a strategic alliance agreement dated 28 June 2001 which created BMA. Operations are managed by BM Alliance Coal Operations Pty Ltd on behalf of the CQCA Joint Venturers under a management agreement dated 28 June 2001.

BMA has equal ownership and management of seven central Queensland coal mines, all located within the Bowen Basin: Goonyella Riverside, Broadmeadow, Peak Downs, Saraji, Norwich Park, Gregory Crinum and Blackwater. BMA also manages the Hay Point Coal Terminal near Mackay, Queensland (refer to Figure 1).

In addition to the above, BMA formerly managed the operations of BHP Mitsui Coal Pty Limited (BMC),, which is owned by BHP Billiton (80 per cent) and Mitsui and Co. (20 per cent). These operations include the South Walker Creek Mine and Poitrel Mine. From 1 July 2010, BMC was established as a fully operational business within BHP Billiton's Metallurgical Coal group with management of its assets and operations no longer under the management control of BMA.

### 2.2 The project

#### 2.2.1 The Bowen Basin Coal Growth (BBCG) project

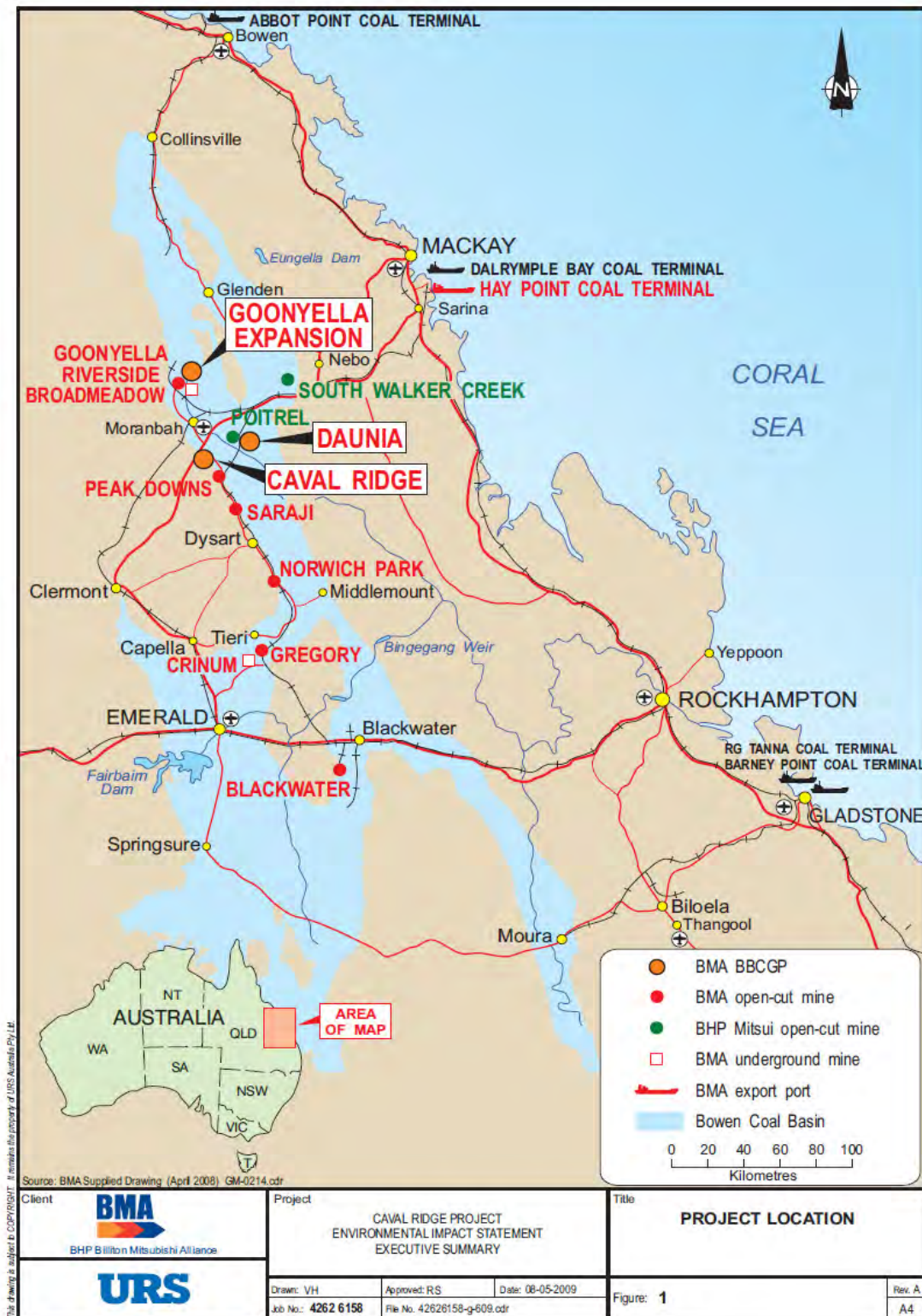
The BBCG project involves the production of an additional 21.5 million tonnes per annum (Mtpa) of coal products through progressive development of four key components:

- a new open cut Caval Ridge Mine (which is the subject of this report)
- a new open cut Daunia Mine (for which a Coordinator-General's EIS evaluation report was completed on 26 October 2009)
- a large expansion of the existing open cut and underground Goonyella Riverside Mine
- construction of a new larger capacity airport in the vicinity of Moranbah.

The Terms of Reference (TOR) for the BBCG projects allows for a separate EIS to be completed for each of its four components. Details of other BBCG project components are still being finalised as part of design and impact assessment processes. An overview and status update of the different project components is provided below.



Figure 1: Project location (EIS Figure 1.1)





### 2.2.1.1 Daunia Mine

The Daunia Mine is located immediately to the east of the Norwich Park Branch railway line, south of the Peak Downs Highway and directly to the east of the existing Poitrel coal mine, which is also managed by BMA. The Daunia Mine includes:

- an open cut coal mine on the Daunia Mining Lease (ML1781) generating up to 5.6 Mtpa of run-of-mine (ROM) coal to produce approximately 4 Mtpa of product coal
- infrastructure to produce semi hard coking coal and pulverized coal injection coal for the export market
- product coal to be railed to the Hay Point and Dalrymple Bay coal terminals for export to international markets
- a new CHPP to be constructed to process ROM coal
- the mining operation and the CHPP to be owner operated.

BMA's application to amend the Daunia Coal Mine environmental authority (EA), from an exploration authority to a non-standard level 1 mining EA, has been approved by the Department of Environment and Resource Management (DERM).

This is the final government approval required for the Daunia Coal Mine project. The Daunia Mine is now subject to final owner approval.

### 2.2.1.2 Goonyella Riverside Mine Expansion

Goonyella Riverside Mine Expansion is located within the existing Goonyella open cut and Broadmeadows underground mines, approximately 30 kilometres north of Moranbah. The mine expansion includes the following proposed key components:

- the existing open cut mine will progress eastwards into Mineral Development Licence (MDL) 307 and to the south-west into Exploration Permit Coal (EPC) 953
- a new mining lease (ML) will be required to cover some of the areas proposed to be mined
- the existing Broadmeadow Mine, which extracts the Goonyella Middle Seam, would be expanded eastwards into MDL307 using either the conventional longwall mining practices currently being used for its operations within ML1763 or see the introduction of longwall top coal caving technology once its feasibility is proven as a means to improve the levels of resource recovery compared to conventional longwall mining methods
- investigations underway for an additional underground longwall operation to the north of the existing Broadmeadow Mine that will move into MDL307 and also be assessed for the introduction of longwall top coal caving technology
- production to increase from 16 Mtpa up to 28 Mtpa of coal products
- a construction workforce of approximately 900 people, with an estimated operating workforce of 700 people
- development of associated infrastructure including a new CHPP and a capacity upgrade to an existing CHPP to provide up to an additional 9.5 Mtpa of product, a new connection to the power grid, and a new water pipeline
- major construction is estimated to begin in mid to late 2012.

Preparation of an EIS for this component of the BBCG project is expected to commence in the second half of 2010. Background studies have been completed to date to inform the environmental assessment.

### 2.2.1.3 Moranbah Airport

BMA is investigating the development of a new airport in the Moranbah region that would be suitable for larger capacity aircraft. The existing Moranbah airport is partially located on ML1775. Options relating to the scale, location and timing of the new airport will be addressed in the EIS for the airport, which is yet to be prepared.

Commercial flights to Moranbah are currently undertaken by Qantaslink. Currently a 50 seat aircraft is the largest sized aircraft able to utilise the Moranbah airstrip. BMA would ensure that the current Moranbah airstrip is able to meet demand generated by the BBCG project components until such time as an alternative facility is available for use.

## 2.2.2 The Caval Ridge Mine

The Caval Ridge Mine (CRM) is proposed to be a new open cut coal mine and is the second component of the overall BBCG project.

The CRM includes the following proposed key elements:

### Location and tenures

- The northern-most boundary of the mine is approximately six kilometres south of Moranbah (approximately 160 kilometres south-west of Mackay), in the Bowen Basin of Central Queensland (see Figure 1).
- The CRM is located north of and adjacent to the existing Peak Downs Mine (existing mining lease ML1775), with Harrow Creek acting as the southern boundary (see Figures 2 and 3).
- The mine industrial area (MIA) and on-site coal handling and preparation plant (CHPP) is approximately 16 kilometres from Moranbah.
- The mine covers an area approximately 17 kilometres long and 4 kilometres wide (excluding the rail spur and overland conveyor).
- The CRM requires a new mining lease, on an area subject to a Mining Lease Application (MLA70403) to the west of ML1775, for site infrastructure and out-of-pit spoil dumps.
- It includes Horse Pit (north of Peak Downs Highway and south of the Horse Creek diversion near the proposed northern ML70403 northern boundary) and Heyford Pit (between Harrow Creek and Cherwell Creek, south of the Peak Downs Highway).
- The CRM site includes a number of land parcels, with the predominant land tenure being freehold (see Figure 4). BHP Billiton Coal and its associated parties are the registered owners of the majority of the lots.
- It is located within the upper Isaac River catchment of the Fitzroy River Basin.

### Production and timing

- The open cut coal mining would be undertaken by dragline and truck and shovel.
- New mine production up to approximately 5.5 Mtpa of hard coking coal for the export market over a life of approximately 30 years.
- An additional 2.5 Mtpa sourced from the existing Peak Downs Mine would be processed through the new CHPP (bringing total throughput to 8 Mtpa). This incremental 2.5 Mtpa does not form part of the CRM as it is within the currently approved capacity of the Peak Downs Mine.
- Construction of the CRM is expected to commence in 2011, with first coal to be produced in 2013.



### **Mine infrastructure**

- The MIA includes site offices, workshops, stores, magazine, communications, car parking and some other minor facilities.
- The overland conveyor would connect the Peak Downs Mine run-of-mine stockpile (ROM) to the CRM CHPP.
- A conveyor would transfer product coal from the CHPP to the train load out facility.
- A new tailings belt-press filter dewatering technique would be incorporated into the CHPP.

### **Workforce and expenditure**

- The construction workforce would be approximately 1200 people, with an estimated operating workforce of 495 people.
- BMA is likely to use a construction contractor, but operate the mine and CHPP with its own employees.
- Construction capital expenditure would be approximately \$4 billion over 25 months and operational expenditure would be approximately \$475 million per year.

Figure 2: Caval Ridge Mine and Peak Downs Mine location (EIS Figure 1.2)

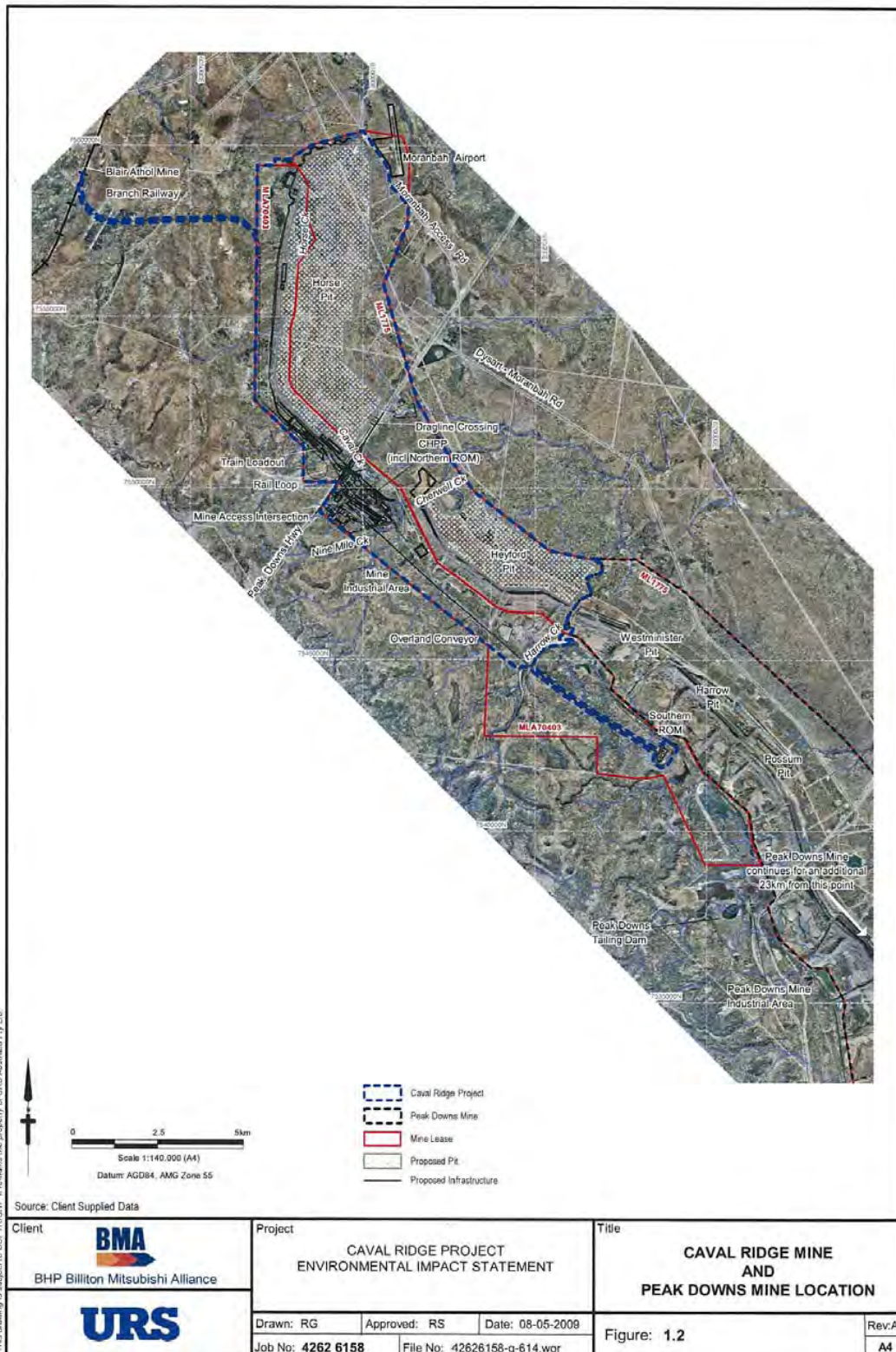




Figure 3: Project site (EIS Figure 1.3)

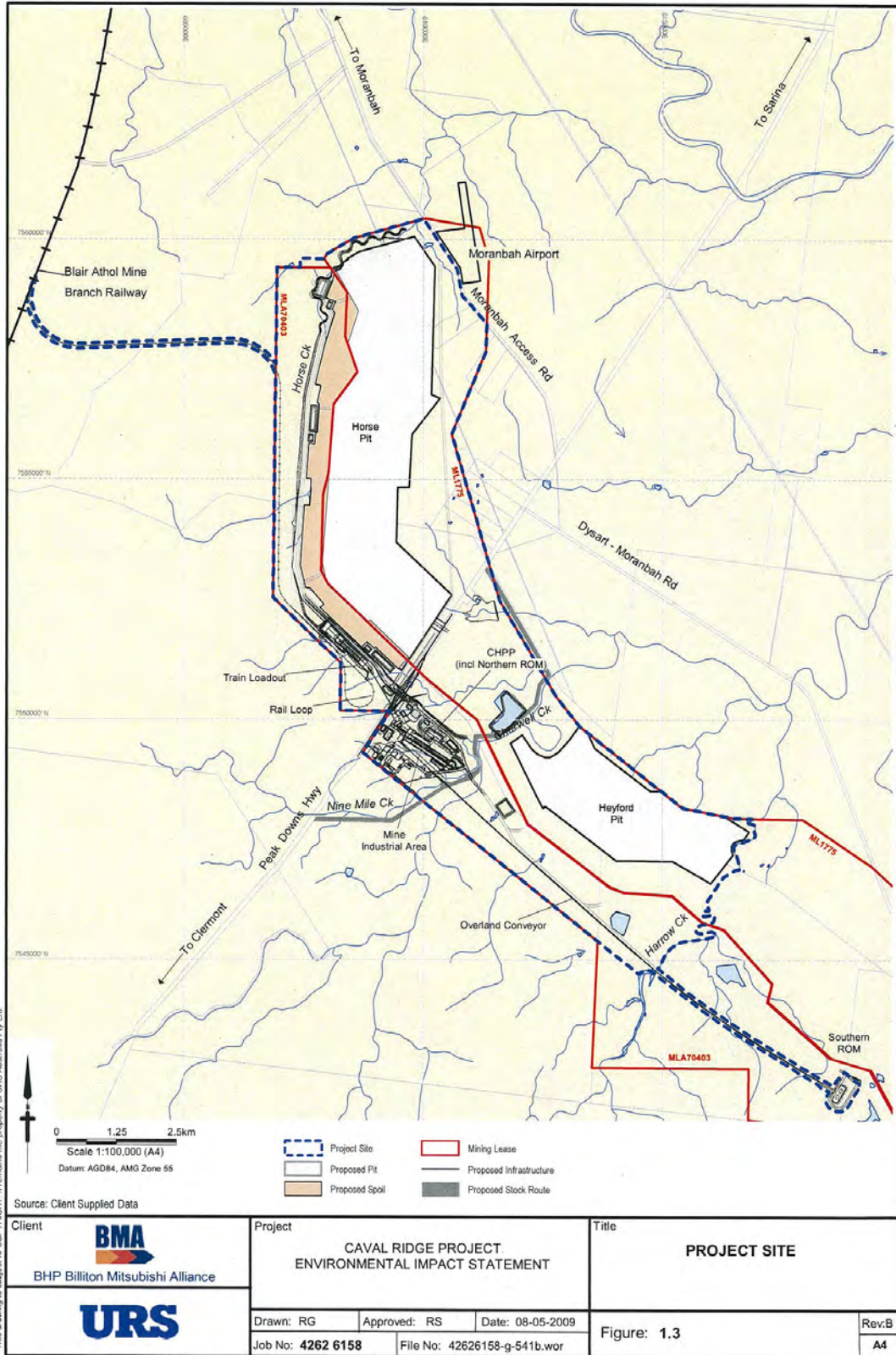
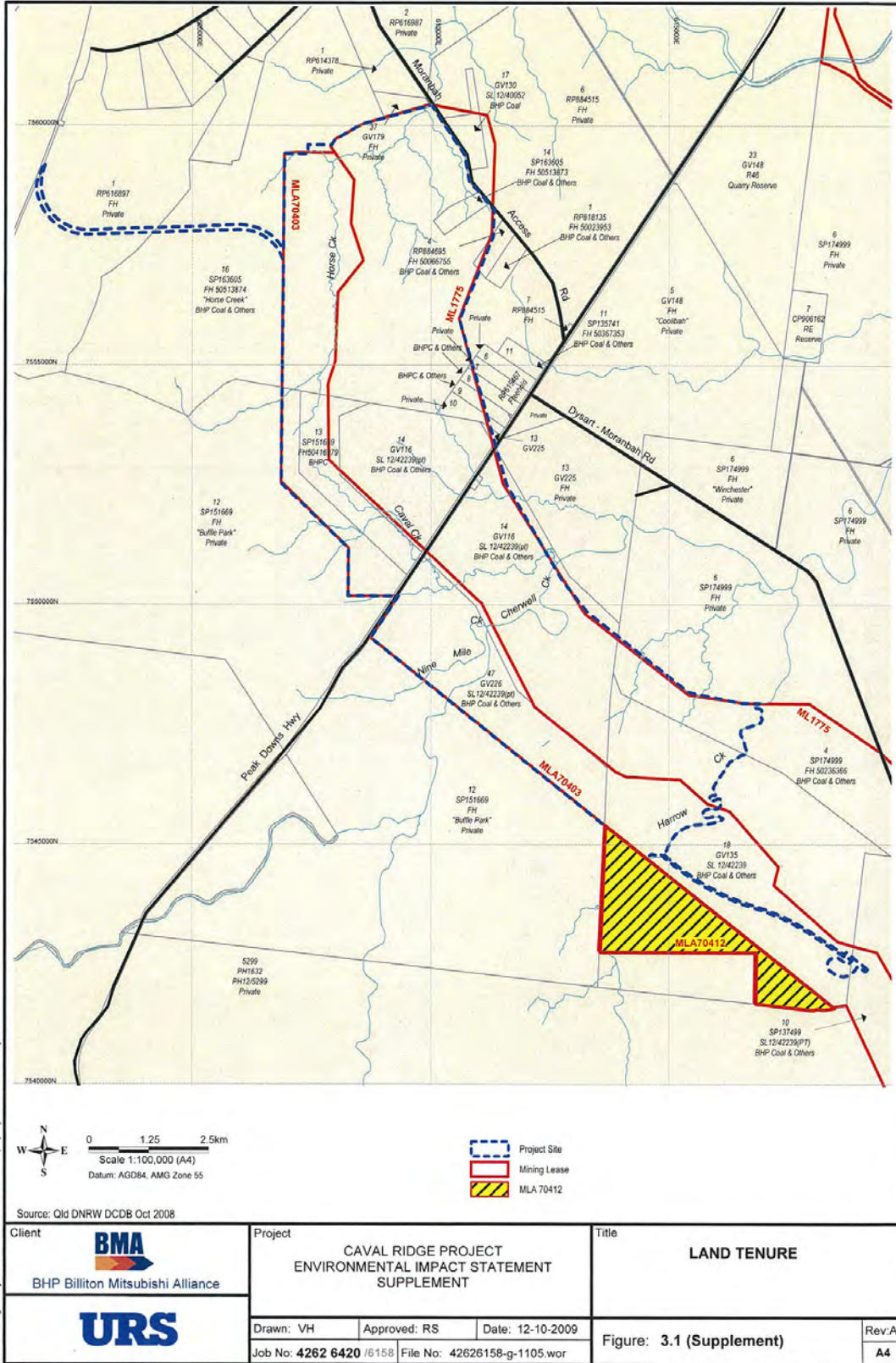


Figure 4: Land tenures (SEIS Figure 3.1)





### **Water and power**

- A mine water management system would be operated to divert clean water, and capture and manage mine area runoff and pit water for reuse.
- Process water would be supplied using a combination of reuse on the site, and additional water supply from the existing Eungella-Bingegang pipeline.
- A new connection to the power grid and a new water pipeline connection is required.
- Power would be supplied via an overhead 66 kilovolt (kV) transmission line from the existing Moranbah 66 kV line.

### **Spoil and mineral waste**

- New out-of-pit spoil dumps would be created on MLA70403.
- Once there is sufficient space for in-pit dumping, pits would be progressively backfilled, and spoil and out-of-pit spoil dumps would be rehabilitated.
- Process waste, comprising both coal rejects and dewatered tailings from the CHPP, would be returned by truck and disposed of in the mine's spoil dumps.

### **Roads and rail**

- Road access to the site would be via the Peak Downs Highway.
- Mine haul roads would connect open cut pits to the new CHPP on MLA70403.
- Peak Downs Highway would be elevated to cross over the mine haul road and infrastructure corridor, thus separating the public from the mining operation.
- A rail spur and loop would be constructed from the main Blair Athol line to the train load out facility.
- Coal would be railed either to the Hay Point and Dalrymple Bay coal terminals (via the existing Goonyella Rail System), or to the Abbot Point Coal Terminal (via the Newlands Rail System upon completion of the proposed Northern Missing Link Rail).

## **2.3 Project rationale**

### **2.3.1 Bowen Basin Coal Growth project**

Australia is the world's largest exporter of coal and Queensland is responsible for approximately two thirds of coal exports. The top four export destinations are Japan, Korea, China and India, with Asia continuing to demand coal for steel-making and thermal energy purposes.

In the financial year ending 30 June 2009, coal contributed \$3.10 billion in royalties to the Queensland Government, up from \$1.03 billion in the year to 30 June 2008<sup>1</sup>. Royalty revenue from coal was sharply revised downward in 2009-10, due to a substantial fall in the contract price for coking and thermal coal, down approximately 50 per cent from the 2008-09 record high, coinciding with the global economic downturn.

However, demand for Queensland coal is expected to remain strong, particularly from China and India, which have experienced continued high economic growth during 2009-10. Looking to 2010-11, Queensland Treasury<sup>2</sup> anticipates the coal outlook for Queensland to be positive, noting key coal mining proposals, and port and infrastructure expansions such as the Abbot Point and Hay Point coal terminals, will continue to boost domestic capacity.

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<sup>1</sup> DEEDI/QME [http://www.dme.qld.gov.au/mines/mining\\_royalties.cfm](http://www.dme.qld.gov.au/mines/mining_royalties.cfm),  
[http://www.dme.qld.gov.au/mines/coal\\_statistics.cfm](http://www.dme.qld.gov.au/mines/coal_statistics.cfm)

<sup>2</sup> Queensland Economic Review, Queensland Treasury, March 2010, ISSN 1038-3182.



The coal industry is also a mainstay of rail and port services in central Queensland, and it generates significant construction, operation and secondary employment and investment to the Queensland economy.

The four components of the BBCG project are expected to provide significant investment in the state, region and local towns, and employment opportunities for the Whitsunday Hinterland and Mackay (WHAM) region.

### **2.3.2 Caval Ridge Mine**

The CRM will contribute significantly to the state in rail freight and royalties. This contribution, coupled with the direct and indirect employment opportunities and associated spending, highlights the value of the mine to Queensland. The EIS (section 2.1.5) estimates that, with flow-on effects, the CRM would generate 7000 to 9000 jobs in the WHAM region and an additional 3700 to 4900 jobs nationally, and added value for industries in Mackay Region up to approximately \$600 million annually.

The EIS also notes that the CRM would result in additional social and community benefits to the Moranbah community through the BMA Community Partnership Program.

### **2.3.3 Need for the project**

The CRM's high quality hard coking coal for steel-making is attractive to overseas buyers. The CRM forms part of a growth strategy designed to strategically service the expanding demands of China, India and other international metallurgical coal markets.

As noted above, while lower coal contract prices and an appreciation in the Australian dollar caused commodity export earnings to fall in 2009-10, coal export volumes and commodity prices are expected to grow again in 2010-11, as the world economy benefits from a return to global economic growth.

### **2.3.4 Alternatives to the project**

The EIS (section 2.4) presented an analysis of the project alternatives, including the 'no project' option; and discussion on the extent of mining (limited by the extent and quality of the resource within ML1775); optional mining methods; on-ground-configuration (e.g. water course deviations); water, rail, electricity infrastructure; and workforce and accommodation considerations.

The EIS considered that the construction of new CHPP facilities for the CRM was necessary as the capacity of the adjacent Peak Downs Mine to process additional coal was not available. Should the mine not proceed, the site would still be mined, but at a slower rate as the Peak Downs Mine extends into the balance of ML1775.

In the event that the mine was not to proceed:

- a total of 1200 construction jobs and 495 operational job opportunities (including contractors), along with the flow-on (indirect) employment opportunities, would not be created
- significant export income would not be realised
- injection of revenue into the regional economy would not occur
- significant Queensland and Commonwealth Government taxes and royalties would not be generated
- the economic opportunity of developing a coal resource which is viable and in demand would not be realised.

Acceleration of the development of an alternative resource outside of the BBCG project is less attractive due to comparatively higher development and operating cost of the mining activities, and generally lower resource quality.



## 3. Environmental impact assessment process

### 3.1 Declaration as a significant project and controlled action

BMA lodged an initial advice statement (IAS) for the overall BBCG project, of which the Caval Ridge Coal Mine (CRM) is a component, with me on 27 May 2008.

On 18 July 2008 the then Coordinator-General declared the BBCG project to be a 'significant project for which an EIS is required' pursuant to section 26(1)(b) of the SDPWO Act.

On 20 August 2008, the CRM was referred to the Australian Government Minister for the Environment, Heritage and the Arts for assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act). The EPBC Act establishes an Australian Government process for environmental assessment and approval of proposed actions that are likely to have a significant impact on 'matters of national environmental significance' (MNES) or on Commonwealth Government land.

On 23 September 2008, the CRM was determined to be a 'controlled action' pursuant to section 75 of the EPBC Act—reference number EPBC 2008/4417. The controlling provisions are sections 18 and 18A (listed threatened species and communities) of the EPBC Act.

The EIS process has been undertaken in accordance with the requirements of the bilateral agreement between the Queensland and Australian Governments, which accredits Queensland's assessment process for significant projects under the SDPWO Act. Therefore, the EIS was required to address both state and Australian Government matters.

The controlled action may be considered for approval under section 133 of the EPBC Act once the Minister has the Coordinator-General's EIS evaluation report from the EIS process prepared under section 35 of the SDPWO Act.

The draft terms of reference (TOR) for the EIS for the BBCG project were advertised for public comment on 9 August 2008. Comments were accepted until close of business on 5 September 2008. A final TOR for the BBCG project was issued to the proponent in November 2008.

In accordance with section 32(4) of the SDPWO Act, the EIS for the BBCG project is due in November 2010. As the impact assessment for the four components of the BBCG project is being conducted as a staged process under section 32(1)(b) of the SDPWO Act, and the EIS for the CRM component was prepared under section 32(2) of the Act, **I may state** in accordance with section 32(3) of the Act a new date by which the proponent must give the Coordinator-General the EIS for the next stage of the project. I consider that, given the large scale and complexity of the BBCG project and the good progress made to date by BMA, a 12 month extension to the normal two-year period to deliver the EIS for the Goonyella-Riverside component of the project is warranted. Therefore, **I state** in accordance with s32(3) of the SDPWO Act that the EIS for Goonyella-Riverside component of the project should be given to the Coordinator-General by 30 November 2011.

### 3.2 Public review of the EIS

A number of Australian, state and local government agencies and other appropriate authorities were invited to participate as advisory agencies for the EIS process and to provide comment on the EIS.

The EIS for the CRM was released and advertised for public and advisory agency comment on 11 July 2009 in the regional, state and national newspapers—Mackay Daily Mercury, Courier Mail and Weekend Australian.

The EIS was displayed at:

- Dysart Library, Shannon Crescent, Dysart
- Dysart Customer Service Centre, Isaac Regional Council, Shannon Crescent, Dysart
- Mackay Customer Service Centre, Mackay Regional Council, Gordon Street, Mackay
- Mackay City Library, Gordon Street, Mackay
- Moranbah Customer Service Centre, Isaac Regional Council, Batchelor Parade, Moranbah
- Moranbah Library, Grosvenor Complex, Moranbah
- State Library of Queensland, Cultural Centre, Stanley Place, South Bank, Brisbane.

Information on the CRM EIS process was available via the BMA and DIP websites. Advisory agency meetings were conducted in late July in both Brisbane and Mackay. In response to community and Isaac Regional Council (IRC) requests, the EIS consultation phase was extended by one week, from 17 August 2009 to 24 August 2009.

The following advisory agencies were requested formally to conduct an evaluation of the EIS.

- Department of Communities
- Department of Education and Training
- Department of Community Safety
- Department of Employment, Economic Development and Industry (DEEDI)
- Department of Communities
- Department of Environment and Resource Management (DERM)
- Department of Transport and Main Roads (TMR)
- Powerlink Queensland
- Queensland Health
- Queensland Police
- QR Limited
- Department of Environment, Water, Heritage and the Arts (DEWHA)
- Queensland Treasury
- Department of Premier and Cabinet
- Isaac Regional Council (IRC)
- Mackay Regional Council.

Following the six week public review of the EIS, 467 submissions, petitions and emails were received in response, including nine submissions received from the following advisory agencies:

- DEWHA
- Queensland Police
- DERM
- DEEDI
- Department of Community Safety



- DTMR
- IRC
- Queensland Health
- Department of Communities.

458 submissions were received from non-advisory agency public submitters. These public submissions were received in a number of formats, including email/petition master template type submissions, letters and individual emails. Template type email/petition submissions were most common, with 91 per cent of public respondents choosing to utilise this format.

The substantive issues raised in the 458 public submissions during the EIS process related to:

- air quality including dust emissions (34 per cent of public respondents' concerns by general category)
- noise and vibration (20 per cent of public respondents' concerns by general category)
- traffic (17 per cent of public respondents' concerns by general category)
- social impacts (including cumulative impacts) and accommodation (19 per cent of public respondents' concerns)
- town water supply and water quality issues (6 per cent of public respondents' concerns).

Other issues raised by advisory agencies included vegetation offsets (DEWHA and DERM) mineral waste and waste water (DERM), surface water resources (DERM), emergency response (Department of Community Safety), policing resources (QPS), pressure on community services (Department of Communities), land rehabilitation and cumulative impacts of ongoing mine development in the Bowen Basin (IRC).

The issues listed above are discussed individually in section 5 of this report. Any conditions of development necessary to manage the environmental effects of the development are presented in that section for each topic.

### 3.3 Supplementary EIS

All submissions were forwarded to BMA for consideration and, following discussions with the proponent and its technical consultants, the then Coordinator-General determined that the preparation of a supplementary environmental impact statement (SEIS) was necessary to address substantive issues that were raised.

BMA lodged a SEIS on 9 November 2009 and it was released for agency comment and public submitter viewing on 13 November 2009. The SEIS was available for review on the BMA website and was accessible via a link on the DIP website.

Advisory agencies were invited to comment on the SEIS and to provide specific advice to the then Coordinator-General for consideration for inclusion as conditions or recommendations in this report. Comments from advisory agencies were received during December 2009.

The SEIS reflected a number of changes to the CRM description since the preparation of the EIS. These included:

- a re-design of the overland conveyor to reduce the impacts of vegetation clearance and fragmentation of an endangered ecosystem
- an additional two pit ramps included in Horse Pit to reduce haul distances and assist in dust suppression
- optimisation of composition of mine equipment and haul method to assist in dust suppression.

## 3.4 Other public information and consultation activities

BMA conducted a public information and consultation program through the EIS process. Consultation included activities such as:

- newsletters distributed to Moranbah residents
- advertising and media releases
- fact sheets
- BMA website
- static and mobile displays
- key stakeholder briefings
- Council meetings
- Community Reference Group meetings
- affected property owner discussions
- one-on-one meetings with affected property owners
- community contact points (free call information line and enquiry email address).



## 4. Approvals

The *State Development and Public Works Organisation Act 1971* (SDPWO Act) establishes the framework for environmental assessment of declared significant projects in Queensland and is the controlling legislation for the BBCG project at the state level.

The impact assessment is undertaken in accordance with the provisions of Part 4 of the SDPWO Act and evaluation of the EIS is pursuant to section 35 of the Act.

The state-based planning and approvals framework applicable to the development of the Caval Ridge Mine (CRM) component of the BBCG project is primarily established by the:

- *Mineral Resources Act 1989* (MRA) that regulates mining tenures
- *Environmental Protection Act 1994* (EP Act) that regulates environmentally relevant activities (ERAs) and environmental authorities (EAs) for mining activities
- *Sustainable Planning Act 2009* (SPA), which superseded the *Integrated Planning Act 1997* (IPA) in December 2009, that regulates development off the mining lease areas.

SPA establishes the system in Queensland for planning and development assessment, and provides the Integrated Development Assessment System (IDAS) for development assessment and approval.

**I note** that all aspects of development of a mining activity for which an EA (mining lease) applies are exempt from assessment against a local government planning scheme under SPA.

Table 1.2 of the EIS and Appendix B of the SEIS provide lists of approvals for the CRM.

### 4.1 Mining leases

The CRM would be carried out partly on land over which a mining lease (ML1775) has already been granted under the *Central Queensland Coal Associates Agreement (CQCAA) Act 1968*. This CQCAA Act is a 'Special Agreement Act'. The CRM also requires a new ML under the MRA, for site infrastructure and out-of-pit spoil dumps on an area subject to ML Application (MLA) 70403, to the west of the existing Peak Downs ML1775.

The 42-year lease on ML1775 expires on 31 December 2010. If the lease is extended under the CQCAA Agreement, then it is arguable that some of the conditions that I impose in this report under section 54B of the SDPWO Act or recommend under section 52 of the SDPWO Act only apply to the extent that the CQCAA Act does not apply. However, the CRM effectively would occur over both ML1775 and proposed ML70403, so a condition that applies to ML70403 would effectively apply to the whole of the mine.

If ML1775 is brought under the MRA, then there would be no distinction between the two mining leases in the application of conditions in this report. **I note** that:

- it is DEEDI's current intention to bring ML1775 under the MRA
- section 616A of the EP Act clarifies that if there is any inconsistency between a condition under a Special Agreement Act and a condition under the EP Act (such as those stated in Schedule 3, Appendix 1 of this report under section 49 of the SDPWO Act then the former will apply.

The CRM is also subject to the *Mineral Resources (Peak Downs Mine) Amendment Act 2008*, and further discussion of that is provided in section 5.1.1 of this report.

There are no conditions in this report stated under section 45(1) of the SDPWO Act. Therefore, I am not obliged to give a copy of this report to the Minister administering the MRA.

### 4.2 Environmental authority

Under the EP Act, an EA is required to carry out 'mining activities' as defined under section 147 of that Act. The CRM would involve the following types of mining activities:

- mining under the MRA
- processing mined materials
- a number of activities directly associated with, or facilitating or supporting, the mining and processing activities
- rehabilitation/remediation
- actions taken to prevent environmental harm.

**I note** that, under the EP Act, an environmental management plan (EM plan – discussed further in section 7 of this report) must be submitted to the administering authority (DERM) with the application for an EA. Approval of the EA and therefore approval of the EM plan is in accordance with section 193 of the EP Act.

Certain developments on the ML areas that would otherwise be assessed against a local government planning scheme under SPA require a development permit to be directly obtained from the relevant assessment manager. For the CRM these include:

- waterway barrier works — *Fisheries Act 1994*
- water course diversions — *Water Act 2000*
- taking or interfering with artesian or sub artesian water (i.e. construction of groundwater bores) — *Water Act 2000*.

Approval for clearing of native vegetation is conditioned by the EA.

Movement of regulated waste is subject to a waste tracking system under the *Environmental Protection (Waste Management) Regulation 2000* and requires waste transport certificates for the collection, transport and management of regulated wastes from the CRM site.

In consultation with DERM, **I have stated numerous conditions**, under section 49 of the SDPWO Act, contained in Schedule 3 Appendix 1 of this report, that are to be attached to the EA. I will give a copy of this report to the Minister administering the EP Act.

To remove any uncertainty, **I clarify** that:

- any conditions stated for the environmental authority for ML70403 in Schedule 3, Appendix 1 of this report are intended to apply to the CRM as a whole, and
- should ML1775 be brought under the MRA, then the conditions stated for the environmental authority for ML70403 in Schedule 3, Appendix 1 of this report are intended to apply to ML1775.

## 4.3 Environmentally relevant activities

Under the EP Act, a development permit approved by DERM is required to carry out an environmental relevant activity (ERAs). As mentioned in section 4.2 of this report, the provisions of the EA (mining activities) also provides authority for any ERA under the EP Act that occur on the mining leases.

The EA for the CRM also provides authority for any ERAs under the EP Act that occur on the mining leases. These include:

- ERA 8 — chemical storage
- ERA 31 — mineral processing
- ERA 56 — regulated waste storage
- ERA 63 — sewage treatment.



EAs for ERAs that are not on the mining lease may still be required, for example, for the construction and/or operation of any temporary workers' village.

## 4.4 Coordinator-General imposed conditions

As a number of impacts of the CRM requiring mitigation or offset cannot be appropriately stated as conditions on the EA or ML, or are not the subject of a development approval under SPA or any other statutory authority, **I have imposed** conditions, under section 54B of the SDPWO Act, which are contained in Schedule 1, Appendix 1 of this report.

**I have nominated** in Schedule 2, Appendix 1 of this report an appropriate entity that is to have jurisdiction for each imposed condition.

## 4.5 Isaac Regional Council

The CRM is located within the Isaac Regional Council (IRC) local government area. Following local government amalgamations on 15 March 2008, the IRC has administered the former Belyando, Broadsound and Nebo shire planning schemes (that were compliant with IPA).

The IRC has raised a range of issues concerning the construction and operation of the mine that may impact upon local government infrastructure and services.

Development approval for material change of use (MCU) will be required from the IRC for any development off the mining lease that is not subject to section.319 of the MRA or Schedule 9 of SPA (e.g. a new workers village accommodation village located off the ML and, potentially, other forms of support infrastructure located off the ML). No such MCU application has yet been made by BMA for the BBCG project, but such applications are anticipated.

**I consider** that any such future MCU application for a workers accommodation village required for any component of the BBCG project will require assessment under Part 4 of the SDPWO Act and I have specifically imposed Condition 14(d), Schedule 1, Appendix 1 of this report to clarify this point with respect to the CRM. To remove any uncertainty, **I clarify** that assessment of any specific workers accommodation proposal for the CRM or the BBCG project off the mining leases is not part of this report.

## 4.5 Other state approvals

A permit to interfere with native wildlife (flora and fauna) under the *Nature Conservation Act 1992* will be required from DERM.

Other approvals may be required for CRM activities off the mining lease that are not related to the EA (mining lease) or development approval by IRC. These include:

- development permit for waterway barrier works (off ML) — SPA and *Fisheries Act 1994*
- taking or interfering with artesian or subartesian water (i.e. construction of groundwater bores) (off ML) — SPA and *Water Act 2000*
- permit to work in or interfere with a state-controlled road — *Transport Infrastructure Act 1994* (TIA)
- cultural heritage management plan (CHMP) — *Aboriginal Cultural Heritage Act 2003* (ACH Act).

Under section 87 of the ACH Act, a CHMP must be developed and approved where an EIS is required for a project. Furthermore, under section 88 of the ACH Act, the CHMP must be developed and approved prior to obtaining the EA, unless the EA contains conditions requiring that an approved CHMP be in place before any activity occurs that could cause harm to indigenous cultural heritage.



Table 1 below outlines the likely statutory approvals required for the CRM, including the development approvals mentioned above, together with certain other licences, permits and approvals identified during the EIS that are required for this mine under other legislation.

**I have recommended** conditions, under section 52 of the SDPWO Act, contained in Appendix 1, Schedule 4 of this report, that are recommended to be attached to any other statutory state approvals required for the CRM.

## 4.6 Commonwealth approval

As the CRM was declared a 'controlled action' pursuant to section 75 of the EPBC Act, the EIS process has been undertaken in accordance with the requirements of the bilateral agreement between the Queensland and Australian Governments.

Therefore, subsequent to this report, the controlled action will be considered for approval under section 133 of the EPBC Act once the Australian Government Minister has received this Coordinator-General's EIS evaluation report prepared under section 35 of the SDPWO Act.



**Table 1: Summary of likely approvals required for the CRM (based on SEIS Appendix B)**

<b>Legislation</b>	<b>Approval</b>	<b>Approval agency</b>
<i>State Development and Public Works Organisation Act 1971</i>	Approval of the EIS	CG
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Approval of the controlled action and EIS (under bilateral agreement)	DEWHA
<i>Environment Protection Act 1994</i>	Approval of EM plan and issue of an EA to operate the mine and amend the EA (and EM plan) covering ML1775 to cover Caval Ridge mine activities on ML1775	DERM
<i>Mineral Resources Act 1989</i>	Grant of mining lease for MLA70403	DEEDI
<i>Sustainable Planning Act 2009 (SPA)</i>	Grant of development permits (if required) for developments off the mining lease not subject to Section 319 of the MRA or Schedule 9 of SPA (e.g. workers village)	IRC
<i>SPA and Vegetation Management Act 1999</i>	Development permit for clearing native vegetation (off mining lease)	DERM
<i>SPA and Water Act 2000</i>	Development permit for water course diversions Development permit for taking or interfering with artesian or subartesian water (i.e. construction of groundwater bores)	DERM
<i>SPA and Fisheries Act 1994</i>	Waterway barrier works (e.g. to construct haul road creek crossings)	DEEDI
<i>Nature Conservation Act 1992</i>	Permit for taking, using, keeping or interfering with a protected animal or plant species listed under the Nature Conservation (Wildlife) Regulation 1994. Permit to be obtained if protected plants or animals are affected by the mine	DERM
<i>Water Act 2000</i>	License for groundwater bores Water Permit to take construction water (e.g. to extract groundwater for construction and development of bores for dewatering coal) Riverine Protection Permit to destroy vegetation, excavate and/or place fill within a watercourse	DERM
<i>Forestry Act 1959</i>	Permit to extract quarry material (if such material is to be used during construction)	DERM
<i>Aboriginal Cultural Heritage Act 2003</i>	Approval of Cultural Heritage Management Plan. Duty of care to take all reasonable and practicable measures not to harm Aboriginal cultural heritage.	DERM
<i>Transport Infrastructure Act 1994</i>	Permit to work in, or interfere with a state-controlled road	TMR
<i>Transport Infrastructure (State-Controlled Roads) Regulation 2006</i>	Approval for additional vehicular access points either side of the Peak Downs Highway within ML1775	TMR
<i>Transport Operations (Road Use Management: Mass, Dimensions and Loading) Regulation 2005</i>	Permit to transport large items of mining equipment	TMR
<i>EP Act and Environmental Protection (Waste Management) Policy 2000</i>	Statutory obligations regarding waste transportation and disposal	DERM
<i>Radiation Safety Act 1999</i>	Licence to hold equipment that contains radionuclide material (e.g. soil / moisture density gauges etc.)	Queensland Health

## 5. Evaluation of environmental effects

The SDPW Act defines 'environment' to include:

- ecosystems and their constituent parts, including people and communities
- all natural and physical resources
- the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community
- the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned above.

'Environmental effects' means 'the effects of development on the environment, whether beneficial or detrimental'. These effects can be direct or indirect, of short, medium or long-term duration and cause local or regional impacts.

This section of the report outlines both the major environmental effects identified in the EIS and SEIS and the significant issues on which impacts may be experienced. Also noted here are the means by which the impacts will be managed for the Caval Ridge Mine (CRM).

The EIS indicates that the following environmental matters will be of significance for the CRM:

- dust emissions, particularly those that may affect the township of Moranbah
- water management system failure, flooding, erosion and sedimentation and creek diversions
- satisfactory performance of the coal fines tailings dewatering system
- offsetting of potential biodiversity impacts for clearing of native vegetation (endangered ecological communities)
- landform stability and rehabilitation
- cumulative social impacts such as workforce and non-resource worker accommodation.

The EIS presents the proponents following key findings and proposed mitigation measures:

- some Class A good quality agricultural land will be disturbed on the site but it is not practical or reasonable to restore or offset this area as it does not significantly compromise the surrounding grazing land and the rural industry of the region
- potential visual impacts on scenic values may be mitigated by retention of vegetation buffer zones, tree and shrub planting, earth mounding, colour selections for various structures and lighting design
- almost all overburden and potential reject materials from coal processing are expected to be non-acid producing
- mine water management system is designed to maximise reuse of mine water to meet mine demands, to reduce likelihood of off-site discharge and requirement for external water supply
- drawdown of groundwater is not anticipated to significantly affect existing regional groundwater users
- clearing of a total approximate area of 780 hectares will be undertaken over the life of the mine, with biodiversity offsets proposed for mitigation



- rehabilitation will be needed to manage impacts on naturally occurring riparian systems resulting in restoration of waterways and management of water quality
- an ambient air monitoring program and operational dust mitigation strategies will be required to ensure that air quality is maintained at levels that are acceptable to the local community and regulators
- a noise monitoring program will be used to validate predictions that noise limits may be exceeded at a small number of sensitive receptor locations
- traffic impacts of the mine will be mitigated through upgrades to intersections and provision of priority-controlled accesses
- BMA has finalised a cultural heritage management plan for the mine
- a social impact management plan is yet to be formally presented to consolidate existing and proposed BMA community strategies.

Management of these impacts will be undertaken by the:

- EM plan as described in section 7 of this report
- conditions of the environmental authority (EA), that includes conditions for environmentally relevant activities that occur on the mine site – see Schedule 3, Appendix 1
- Coordinator-General imposed conditions – see Schedule 1, Appendix 1
- management commitments – included within the EM plan.

This chapter of the report is structured to provide my analysis of key issues of state significance that may be affected by the proposed CRM. For each topic **I have provided** my findings on the EIS, **I have had regard** to submissions received, and **I have considered** the commitments made by the proponent towards mitigating and managing adverse impacts. Finally **I have made conclusions** about the adequacy of the EIS documentation and the proponent's response to the key issues and, where necessary, **I have stated or imposed** conditions of development approval for the CRM or made other recommendations.

## 5.1 Land resources

### EIS findings, submissions and analysis

#### 5.1.1 Geology and coal sterilisation

A map depicting the mining tenures for the CRM, taken from Figure 3.1 of the SEIS is provided as Figure 4 of this report.

Coal characterisation for the Caval Ridge resource has shown the coal to be a single product, hard coking coal that can be derived from a blend of the Dysart and Harrow Creek seams. The EIS states that the economic coal seams of the CRM occur in the Moranbah Coal Measures within the northern Bowen Basin. Primary target seams within the proposed mine are those greater than 30 centimetres in thickness.

Cherwell Creek Coal Pty Ltd made a submission on the EIS stating that it considered that the coal resource contained within BMA's area of mining lease application (MLA) 70403, identified for CRM infrastructure, had not been properly described, and the economic cost of sterilisation of the coal resource had not been assessed. Mines and Energy (formerly Queensland Mines and Energy (QME), a division of the Department of Employment, Economic Development and Innovation (DEEDI)), also requested further clarification on an aspect of potential resource sterilisation relating to two seams known to be present below the lowermost Dysart seam, which is the deepest seam that BMA proposes to mine. As these deeper seams represent a potential resource in the northern part of the site, DEEDI wanted further information on the mine layout for Horse Pit, including justification for the location of out-of-pit spoil dumps and the Horse Creek diversion.

The SEIS (section 5.4.2.1) indicated that the deeper coal seams, located within MLA70403, were considered to be inconsequential and not a viable coal resource due to their thin nature, variability and low quality. Further, BMA advised that the mining layout for Horse Pit was based on the limit of oxidation (LOX) of the lowermost Dysart seam planned to be mined at the CRM. The location of the LOX was determined from historical and recent drilling around the Horse Creek resource.

At any given location, the LOX of a particular coal seam is that location where weathering (i.e. in-situ oxidation) no longer affects the coal seam. Weathering adversely affects the properties of the coal seam usually rendering it unsaleable. However, in some cases, coal that is only partially oxidised due to the effects of weathering, can be sold but usually only as a thermal coal at a substantially reduced price. In a new open-cut mining area, the location of the first (box) cut is a critical factor in attempting to maximise the recovery of the target coal seam. If the box-cut is located at a point where too little weathered coal is present, then mining costs are increased. Conversely, if a box-cut is situated too far down-dip, then unweathered, potentially saleable coal is left unmined and, in most instances is effectively sterilised by the placement of spoil from the box-cut (as would be the case at CRM). Therefore, in open cut mining, the delineation of the LOX throughout the mine area, for each of the coal seams planned for mining, is a critical factor when commencing new pits.

Horse Pit is also constrained by Horse Creek, which is proposed to be diverted (refer to EIS section 3.7.2.3 and section 5.3.1 of this report). Therefore, an alternative location for out-of-pit spoil from the Horse Pit box cut is not available. Until MLA70403 is granted, BMA does not have access or pre-requisite tenure to conduct coal exploration drilling on the infrastructure area to assess if sub-crops of the Lower Dysart seams are viable.

A long-standing tenure dispute between Cherwell Creek Coal Pty Ltd and BMA was resolved when the *Mineral Resources (Peak Downs Mine) Amendment Act 2008* came into force. This amendment legislation rejected Cherwell Creek Coal's applications for mineral development licences (MDLA) 364 and 366, which overlapped BMA's Special Lease (SP) 12/42239. SP12/42239 was granted in 1979 under the then Land Act for 'Industrial (Coal Mining) Purposes' for the Peak Downs Mine. Since commencement of the amending legislation in 2008, BMA has applied for a mining lease (MLA70403) over part of its SL12/42239 area and over areas previously covered by MDLA364 and MDLA366.



In the absence of submission of geological data and analysis from the proponent with respect to resource sterilisation potential over MLA70403, **I have relied** on the assessment of other geological information provided by DEEDI. **I understand** that the assessment by DEEDI has used geological information previously submitted by Cherwell Creek Coal Pty Ltd over areas once within EPC545 and previously covered by MDLAs 364 and 366. DEEDI advises that the assessment undertaken was completed prior to this EIS process as part of the considerations by the then Minister for Mines and Energy as to whether or not to initiate a legislative solution aimed at resolving the long standing dispute between Cherwell Creek Coal Pty Ltd and BMA that eventually resulted in the introduction and enactment of the *Mineral Resources (Peak Downs Mine) Amendment Act 2008*. Further information about the rationale behind that legislative solution is available in the bill's explanatory notes and the then Minister's second reading speech to Parliament.

**I am advised** by DEEDI that the limited extent of sterilisation of coal that may occur on MLA70403, in seams below the lowermost Dysart seam, planned for extraction at the CRM should BMA proceed with the new mine as defined in the EIS and SEIS, would be acceptable. Consequently, DEEDI has further recommended to me that in the absence of any sizeable, economically viable coal resource, the most appropriate and economic use of the land subject to Cherwell Creek Coal Pty Ltd's application for MDLA364 would be for infrastructure to support the proposed CRM.

**I observe** that the placement of CRM overburden and infrastructure on MLA70403 over areas where coal seams may be present would in itself not necessarily prevent the recovery of that coal at some stage in the future, but it would add to the cost of future extraction of any coal present at those locations.

## Conclusions

**I am satisfied** with information provided by DEEDI that the extent of Cherwell Creek Coal Pty Ltd's former MDL application numbers 364 and 366 over the land covered by MLA70403 are classified as 'dead' and therefore no longer applicable.

**I concur** with advice from DEEDI that the possibility of sterilising coal that lies within MLA70403, although undesirable, had been duly considered by the Minister for Mines and Energy as part of his decision to introduce the *Mineral Resources (Peak Downs Mine) Amendment Act 2008*.

**I find** that in introducing the *Mineral Resources (Peak Downs Mine) Amendment Act 2008*, the Minister for Mines and Energy made the decision that whatever benefits to the state that might have been realised from the possible future extraction of potential coal resources in MLA70403 is overridden by broader public benefit (e.g. new employment, training, increased economic activity, revenue) that will result from the development of the CRM and the subsequent placement of infrastructure and overburden within the area.

**I accept** the advice of DEEDI that the limited extent of sterilisation of coal over MLA70403 that would occur should BMA proceed with its CRM proposal would be acceptable.

**I make no specific findings** that should influence compensation proceedings between BMA and Cherwell Creek Coal Pty Ltd that have commenced in the Land Court since the *Mineral Resources (Peak Downs Mine) Amendment Act 2008* came into force.

**I make no recommendations and state no conditions** in relation to this matter.

## 5.1.2 Soils

### EIS findings, submissions and analysis

Determination of soil types that will be disturbed by the mining activities is important so that erosion potential can be assessed and suitable topsoil identified for reuse in rehabilitation.

The EIS identified six soil units within the CRM site. In general, the topsoil in the soil units, with the exception of the skeletal soils, is approximately 15 centimetres in depth and considered suitable as a surface cover for the establishment of vegetation, with no specific

management risk related to topsoil stripping. In general, the subsoils were found to be not suitable for stripping or supporting vegetation.

The EIS (section 4.4.8.3) showed the uniform clay soils to have moderate potential for erosion and BMA has undertaken to manage this potential with the implementation of suitable erosion and sedimentation controls. The potential for acid generation from the topsoil and subsoils on the site was demonstrated to be low and therefore requiring no additional management measures.

In its submission on the EIS, the Department of Environment and Resource Management (DERM) advised that its requirements were not satisfied with respect to the characterisation of soils and subsoils as good quality agricultural land and the assessment of soils for suitability as topsoil during rehabilitation activities.

Additional information and assessment on soils was provided in the SEIS (section 5.4.2). However, DERM advised that its requirements with regard to soil characterisation were still not satisfied. Further to the SEIS, BMA liaised with DERM and in March 2010 provided, to DERM's satisfaction, a Soils Addendum Report<sup>3</sup> to the Caval Ridge Supplementary EIS that adequately addressed the following issues:

- soil survey methodology
- soil unit classification and associated soil unit maps
- land suitability and agricultural land classifications, and associated agricultural land class map
- topsoil stripping criteria, topsoil stripping depths, and associated topsoil strip map.

In relation to this matter, in addition to the material in the EIS and SEIS, **I have also considered:**

- the SEIS soils addendum report provided by BMA's soils consultant
- BMA's commitment to a regularly updated topsoil management plan
- the draft EM plan, including an environmental performance objective to maximise the recovery and reuse of topsoil and mitigation measures relating to topsoil stripping, handling and respreading.

## Conclusions

**I consider that:**

- preparation of a topsoil inventory is required as part of the topsoil management plan for the CRM
- to contribute to the minimisation of the impact of the CRM, the topsoil management plan should include consideration of the rehabilitation requirements of the CRM.

In consultation with DERM, **I state** Conditions F2 and F3, Schedule 3, Appendix 1 for the EA that require topsoil to be stripped ahead of mining disturbance in accordance with a topsoil management plan, and that a topsoil inventory identifying topsoil requirements and availability of suitable topsoil be detailed in the plan of operations.

### 5.1.3 Visual amenity

#### EIS findings, submissions and analysis

The EIS (section 4.7.17.5) describes the landscape character of the CRM site as similar to extensive sections of landscape along the Peak Down Highway.

The CRM site itself is not considered to have visual amenity of state significance. However, at a local level, the CRM site has high landscape significance as it forms part of the southern entrance into the town of Moranbah and will be visible from some parts of Moranbah. The EIS

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<sup>3</sup> GSS Environmental, March 2010, SEIS Soils Addendum Report



also considered the site to be significant in a regional context due to it being visible from the Peak Downs Highway.

The potential visual impact of the CRM has been assessed as high at several locations including the Peak Downs Highway, which runs through the operations, and from the Moranbah Access Road. A relatively small number of submissions on the EIS raised concerns about the potential visual impact of the CRM.

The draft EM plan proposes mitigation strategies that have the objectives of minimising the extent to which the CRM is visible from view points and minimising the visual contrast between major components of the mine. However, it appears inevitable that the CRM will be a strong feature of the visual landscape on the Peak Downs Highway and the southern approach to Moranbah for generations to come.

## Conclusions

**I consider** that implementation of the proposed mitigation strategies outlined in the draft EM plan will have some benefit in reducing the local impact of the CRM on visual amenity.

**I also consider** that additional attention to spoil rehabilitation in locations visible from the Peak Downs Highway and the Moranbah Access Road is justified.

Consequently, **I recommend** (Recommendation 1(a), Schedule 5, Appendix 1) that the results of the proposed mitigation strategies outlined in the draft EM plan be monitored by BMA in consultation with the Isaac Regional Council (IRC) throughout the life of the mine, and those strategies be enhanced wherever they are considered to have insufficiently reduced the visual impacts, as viewed from key viewpoints on the Peak Downs Highway, the Moranbah Access Road and Moranbah.

Notwithstanding the obligations on BMA to provide a satisfactory level of mine site and spoil rehabilitation (discussed in more detail in sections 5.2.2 and 5.2.4 of this report and covered by EA Conditions F4 and F7-F9, Schedule 3, Appendix 1), **I also recommend** (Recommendation 1(b), Schedule 5, Appendix 1) that BMA, in consultation with DERM and IRC, achieves a minimum average of 30 per cent revegetation (foliage coverage) of all elevated spoil areas (excluding tourist lookouts established as part of the project) that are visible from key viewpoints on the Peak Downs Highway, the Moranbah Access Road and Moranbah within three years of completion of placement of spoil in those areas.

### 5.1.4 Land use, land capability and good quality agricultural land

#### EIS findings, submissions and analysis

The Peak Downs Highway Stock Route follows the highway and traverses the central section of the CRM site. BMA proposes to realign the stock route along Nine Mile Creek, to the south of the CRM industrial area and back to the highway north of the mining lease. **I am satisfied** that BMA's realignment as described in the EIS will provide continued access to a suitable stock route.

The CRM site and adjoining areas are currently used for cattle grazing, coal mining, and commercial uses (airport and workshops). The proposed post-mining land use for the CRM site is a mosaic of self-sustaining vegetation communities and grazing land. Management and mitigation strategies have been identified in the EIS to reduce the potential for degradation of the CRM site and surrounding land.

Land capability refers to the overall agricultural potential of the land. The EIS (section 4.4.8.5) found that the majority of the CRM site has a Class VI<sup>4</sup> land capability (not suitable for cultivation and is moderately susceptible to degradation, requiring proper management to sustain land use). Class V land (high quality grazing land) has been identified on the site adjacent to Cherwell and Caval Creeks and surrounding Horse Creek, its tributaries and two

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<sup>4</sup> Rosser, J Swartz, GL, Dawson, NM Briggs, HS 1974, A Land Capability Classification for Agricultural Purposes, DLU Tech Bulletin 13, Queensland Department of Primary Industries, Australia



drainage lines in the southern area. The rocky ridges and skeletal soil areas are identified as Class VII land capability (highly susceptible to degradation requiring severe restrictions for use). All of these classes are considered to be not suitable for cultivation.

Agricultural land suitability is assessed using a range of factors including climate, soils, geology, geomorphology, topography and effects of past land uses and it indicates the potential of the land for such uses as crop production, pasture improvement and grazing. The EIS (section 4.4.8.6) found that the majority of land within the CRM site is unsuitable for cropping. Some areas are marginal for cropping, although these same areas are suitable for low intensity grazing.

With respect to the definition of good quality agricultural land (GQAL)<sup>5</sup>, BMA originally presented mapping in the EIS of the CRM site, using regional data, showing the majority of the site as Class C – suitable for improved or native pastures due to limitations that preclude cultivation for crop production (mix of C1 and C2). The remaining small per cent of the site was mapped as Class A land – crop land and is located in the area surrounding Caval Creek, south-east of the Peak Downs Highway.

In the SEIS, the mapping was reassessed using site specific soil parameters and found that the CRM site was mostly Class C2 with a small area of Class D – non-agricultural land along the rocky ridges.

After comment from DERM on the SEIS that a reassessment was required of the suitability of mapped soils for agricultural use, BMA had the soil unit characterisations reviewed against agricultural land class and rankings for rainfed broadacre cropping and beef cattle grazing. The final soil addendum<sup>6</sup> concluded that four per cent of the land disturbed for the CRM is Class A, 58 per cent of land disturbance is C1, 33 per cent is C2 and 5 per cent is C3. The Class A area to be disturbed on the site is currently not being used for cropping. **I note** that, in Central Queensland, DERM considers Class C1 as GQAL to be conserved where possible.

The mining sector currently provides compensation to landholders for the loss of production resulting from mining development but there is currently no uniform approach to explicitly consider the impact of mining activity on cropping land through tenure grant or environmental assessment processes.<sup>7</sup> A Department of Infrastructure and Planning (DIP) discussion paper about the policy and planning framework for conserving and managing Queensland's strategic cropping land was released for comment in February 2010. The Queensland Government's policy position is as follows:

*“The government considers that the best cropping land, defined as strategic cropping land, is a finite resource that must be conserved and managed for the longer term. As a general aim, planning and approval powers should be used to protect such land from those developments that lead to its permanent alienation or diminished productivity “*

The policy principles that underpin how this will be achieved are:

- planning and development decisions will aim to conserve strategic cropping land for agricultural production
- development proposals, which the State Government considers are in the overwhelming long term public interest, will only be approved where detailed assessment of the impact of the development on strategic cropping land values has been undertaken.

The CRM does not meet the criteria of 'strategic cropping land' as defined in the recent discussion paper and has not been included in any draft interim maps of strategic cropping land in Queensland.

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<sup>5</sup> Queensland Department of Primary Industries, 1993, *Planning Guidelines – The Identification of Good Quality Agricultural Land*, Queensland Government, Australia

<sup>6</sup> GSS Environmental March 2010, March 2010 Addendum

<sup>7</sup> Queensland Department of Infrastructure and Planning, February 2010, *Strategic cropping land – Policy and planning framework discussion paper*.



## Conclusions

**I conclude** that BMA has provided sufficient information in relation to agricultural land classification for the CRM site.

**I find** that it is not practical to restore the Class A land to be disturbed on the CRM site and it is not reasonable to offset this area. Therefore, **I find** the removal of this Class A land does not significantly compromise the surrounding grazing land and the rural industry of the region. This decision should not provide a precedent for the assessment of impact on strategic cropping land in other regions where the significance of cropping to the local, regional and state economy is greater.

**I recommend** (Recommendation 2, Schedule 5, Appendix 1) that BMA, either directly or through the Queensland Resources Council (QRC), participates in industry consultation on the proposed policy and planning framework for strategic cropping land so that BMA's interests are considered during further policy development and implementation.

### 5.1.5 Land disturbance

#### EIS findings, submissions and analysis

BMA proposes to address land disturbance affecting future land use, land capability and land suitability through rehabilitation. BMA's objectives for rehabilitation (refer to EIS section 4.8.5) are stated as:

- achieving a stable landform with self-sustaining vegetation cover
- ensuring progressive rehabilitation proceeds within two years of disturbed areas becoming available
- minimising erosion potential
- ensuring quality of water leaving the CRM site does not cause environmental harm.

The objectives are proposed to be achieved through landform design and planning, topsoil management and surface preparation, control of erosion and sedimentation, ensuring overburden suitability, revegetation, weed management, site water management, maintenance and regular monitoring.

Preliminary performance objectives (success criteria) for the rehabilitation of the CRM site were developed in the EIS (Table 4.30) and included in the draft EM plan.

**I note** that the success of the rehabilitation in achieving a sustainable system is proposed to be measured against these criteria, which were developed for the main landform types that will remain on the CRM site (i.e. spoil and reject dumps, final voids and mine industrial/infrastructure areas). Indicators for vegetation, fauna, soil stability, land use and safety are proposed to be monitored. Success criteria are proposed to be reviewed every three to five years in consultation with stakeholders.

**I note** that BMA included in the EIS its internal Guideline for the Design of Sustainable Mine Landforms.

The SEIS (Appendix E1) contained a Final Void and Landform Management Plan which considered three scenarios:

- base case fence and bund arrangement around the final void
- 25 per cent slope regrade of highwall
- 10 per cent slope regrade of highwall.

Also included in the SEIS was a Long-term Void Water Storage and Quality Report which is discussed further in section 5.3.7 of this Coordinator-General's report (Post-mining water storage and quality in final voids).

In its submission on the SEIS, DERM advised that its requirements for adequate maps and diagrams of final topography of excavations, subsidence, dams and spoil dumps had not

been met. Further to the SEIS, DERM advised that it is satisfactory for BMA to present additional information regarding final voids topography in the revised EM plan for approval with the EA. Requirements that **I have set** in relation to tailings management are discussed further in section 5.2 of this report. Requirements that **I have set** in relation to mine dams are discussed further in section 5.3 of this report.

## Conclusions

**I require** that an investigation be undertaken that develops design criteria for the rehabilitation of the final voids and that a post closure management plan for the CRM site be developed.

In consultation with DERM, **I have stated** the following conditions in Schedule 3, Appendix 1 for the EA:

- F4 that requires BMA to commence progressive rehabilitation within two (2) years of when areas become available within the operational land.
- F5 that requires BMA to progressively update its final void water balance modelling every five years based on the groundwater monitoring program and update the final void designs if model changes indicate that this is required.
- F6 that requires BMA to undertake sufficient investigation to demonstrate that the proposed rehabilitation performance criteria (including stability, safety and water quality) can be met before any void is decommissioned.
- F7, F8 and F9 that require a rehabilitation monitoring program to be developed and implemented to verify the success of the rehabilitation on site.
- F10 and F11 that require the proponent to prepare a post-closure management plan at least 18 months before processing of coal ceases on site, which must have provision for monitoring of surface and groundwater quality, seepage rates, erosion rates and the integrity and health of rehabilitation and vegetative cover.



## 5.2 Mineral waste

Mineral waste includes the overburden/interburden (spoil) removed to expose the coal resource, and coarse and fine rejects from coal processing. The estimated quantity of spoil to be excavated over the 30 year life of mine is more than 2,000 million tonnes. In addition, approximately 161 million tonnes of coarse rejects and 54 million tonnes of fine rejects will be produced from the CRM coal handling and preparation plant (CHPP).

### 5.2.1 Characterisation of mineral waste

#### EIS findings, submissions and analysis

The removal of spoil and mining of coal may allow oxidation of sulphidic material within the sediments that contain the coal measures. The resulting sulphuric acid can make mine water drainage acidic and increase the levels of metal and sulphate concentrations. Therefore, spoil materials are characterised during the feasibility stage of a project to determine whether potential acidic conditions may arise during operations. In addition, trials of coal washing produce samples of reject material that can also be characterised during feasibility and design stages.

The geochemical assessment undertaken by BMA for the EIS (section 5.1) had the following objectives of determining the:

- potential for acid mine drainage
- concentrations of trace metals in the spoil and the potential for contamination
- feasibility of using the spoil material for site rehabilitation.

In the EIS (section 5.2.2), BMA reported that composite spoil and reject samples had been tested, with results indicating that metals concentrations were low, although the materials may contribute elevated salinity levels to the environment.

The EIS also reported that geochemical testing showed that all the spoil material and almost all the potential rejects would be non-acid forming (NAF). One coal seam roof sample was classified as potentially acid forming. The ratio of median acid neutralising capacity to maximum potential acidity was 31:1 for the samples tested. This indicates that the spoil and rejects have a large capacity to neutralise acidity compared to its capacity to generate acidity (EIS section 5.2.1).

BMA proposed ongoing overburden characterisation through drilling. As past investigations have shown NAF characteristics, no selective management strategies are suggested by BMA and only seepage/runoff water quality is proposed to be monitored (SEIS section 5.5.2.2).

**I understand** that BMA has committed to ongoing characterisation of spoil by a qualified geochemist as the CRM is developed and during operations, in order to inform spoil disposal planning.

#### Conclusion

**I am satisfied** that the EIS and SEIS have sufficiently characterised the mineral waste.

### 5.2.2 Disposal of mineral wastes

#### EIS findings, submissions and analysis

In the EIS, BMA described its proposal to dispose of the spoil predominantly into Horse Pit and Heyford Pit, behind each operating strip. In order to construct the box cut in Horse Pit, an out-of-pit spoil dump would be required during the first year of operations.

The proposal for disposal of rejects from the CHPP, as described in the EIS, is as follows:

- coarse rejects would be dewatered

- fine rejects would be thickened and dewatered
- flotation tailings would be thickened and put through a belt press filter to be dewatered (refer to section 5.2.3 of this report)
- all three reject streams described above would be combined, resulting in rejects material with approximately 20 per cent moisture being truck dumped into Horse and Heyford Pits and mixed into the spoil material by dozer.

The combined spoil and rejects stockpiles are proposed to be re-profiled progressively, in accordance with BMA's internal *Guideline for the Design of Sustainable Mine Landforms* (refer to EIS, Appendix R5).

In its submission on the EIS, DERM sought more information on the proposed tailings and rejects management system.

In response to DERM's submission on the EIS, BMA prepared a Tailings and Rejects Management Plan (SEIS, Appendix N). This Plan, in part, aims to ensure the effective transport and disposal of coal rejects and tailings at the CRM through the implementation of a number of protocols as follows (refer to SEIS, Appendix N, section 1.5.4):

- trucking of reject material to in-pit spoil stockpiles and mixing to eliminate concentrated dumping
- development of spoil stockpiles in accordance with mine plan
- ensuring no reject material placed within 10 metres of final spoil landform slope
- implementation of survey controls to ensure no rejects are placed below the pre-mining groundwater table.

Stability of the disposal stockpiles relies on proper mixing of the rejects and dewatered tailings into the spoil. The process of dewatering the fine rejects/tailings is discussed in section 5.2.3 of this report.

In order to manage the physical and chemical stability of the mineral waste disposal stockpiles, BMA has committed to develop a mineral waste management strategy, to be implemented through the EM plan (refer to SEIS Appendix O, sections 3.7.6 and 3.7.7). The strategy will be designed to focus on the placement of mineral waste materials to minimise runoff and erosion, and the evaluation of the geochemical characteristics from untested areas. The strategy also refers to the rehabilitation of the mine site as provided for by draft EA Conditions F4 and F7-F9, Schedule 3, Appendix 1.

**I am satisfied** that, subject to resolution of the matters discussed below in section 5.2.3 of this report, the mineral waste management strategy and the associated monitoring and characterisation of mineral wastes proposed for the EM plan will ensure appropriate disposal of the mineral wastes comprising spoil, coarse rejects, fine rejects and tailings.

## Conclusion

**I am satisfied** that, by adopting the mineral waste management strategy outlined in the EIS and SEIS, and the implementation of that strategy through the EM plan, BMA will be able to undertake ongoing monitoring and characterisation of spoil and reject material with the objective of determining the most appropriate method of disposal and rehabilitation.

### 5.2.3 Dewatering of tailings

#### EIS findings, submissions and analysis

The use of belt press filters for dewatering tailings is still in the trial and development stage in the Bowen Basin. In its submission on the EIS and SEIS, DERM expressed concern regarding the proposed technology for dewatering of tailings, drawing comparisons between the management of tailings and rejects at the CRM with the Poitrel and Millennium mines. DERM has also separately advised of additional difficulties encountered with belt press technologies at several other sites elsewhere in the Queensland coal fields.



In particular, DERM is concerned that no reasonable dewatering alternative had been provided for tailings that are too wet (with a shear-strength of less than 1000 Pascals (Pa)) thus presenting a slumping risk when mixed with spoil for disposal. Slumping may cause a significant safety hazard or result in significant environmental harm.

DERM requested commitments from BMA with respect to:

- operational measures that guarantee minimum standard of mixing of rejects/tails with spoil, and
- development of a contingency plan in case of failure of the proposed belt press filter dewatering system (i.e. a conventional tailings storage facility).

Following its submission on the SEIS, DERM requested further information on where and how the tailings would be stored in the event that a critical 1000 Pa shear-strength limit is not reached by the proposed treatment system.

In response to the DERM submission, BMA produced a Tailings and Rejects Management Plan (Appendix N of the SEIS), which further discussed the design of the proposed belt press filter units. The rejected fine coal solids are thickened to slurry that is then pumped to multiple belt press filters where it is compressed between two layers of filter cloth over a series of high pressure rollers. Any free water is squeezed from the filter cake. The final cake is still considered to be saturated, as the water is removed by compression and shearing only. When operating effectively, the final filter cake is discharged as relatively solid lumps onto conveyors and trucked with the other reject material for disposal with spoil (SEIS Appendix N section 1.3.4).

CHPP simulations have been completed by BMA using LIMN (process modelling software). Recommended capacity of each belt press filter unit by the manufacturer is eight to 10 tonnes per hour per metre of belt width. The proposed belt width is three metres, therefore each unit has a recommended capacity of 24 to 30 tonnes per hour. BMA proposes to install 24 units, with 16 required for nominal operation and 22 for the maximum operation. This leaves 2 units as back-up in the event of mechanical or process failure.

BMA is confident that the plant can handle the potential mechanical and reagent/feed failures in such a way that a contingency conventional tailings storage facility would not be required. This is due to the number of units available, the ability to slow the belt speed and the ability to recycle the waste back into the tailings thickener for several hours without stopping production. BMA has planned for tailings cells within the mine industrial area that are capable of storing 24 hours of full feed production waste.

In response to DERM's concerns regarding the back up tailings storage facility, BMA provided a map of the CRM site showing the proposed location of a concept tailings/settling facility designed to treat up to approximately 2.7 million cubic metres of tailings per year (i.e. 1.5 million tonnes per year, with solids density of 1.8). The facility is proposed to consist of three cells, each five metres deep and proposed to be located on the mining lease, outside the 30 year mine pit. BMA proposes to relocate the cells as the mining operation approaches, onto the already disturbed area or further to the east of ML1775 on commercially acquired land. BMA intends to remove tailings from the cells as they dry out and dispose of these tailings within the spoil.

**I note** that the same concerns about the performance of BMA's proposed belt filter presses were raised by DERM during the then Coordinator-General's assessment of the Daunia mine EIS during the second and third quarters of 2009 and BMA has not since provided sufficient information to alleviate DERM's concerns regarding the capacity of this technology to function as proposed at full operational capacity.

**I note** that a pilot scale belt press filter machine is located at Peak Downs Mine and BMA is testing the behaviour of the tailings within the unit, but that few results from this machine have yet been provided (contrary to the then coordinator-General's expectation when the EIS evaluation report was prepared for the Daunia Mine). **I consider** that the results provided by BMA to DERM at the time of finalisation of this Coordinator-General's report have no statistical validity with respect to the operational scale applications proposed by BMA.

**I note** that DERM supports the concept of sufficiently dry and stable tailings mixed adequately with the spoil in pit as a management strategy likely to present less long term environmental challenges than large scale tailings storage facilities which must be treated as hazardous dams over a long period of time.

**I am informed** that DERM accepts that the belt press filter technology may eventually prove to be viable under the conditions proposed for the CRM. However, DERM is still not satisfied that BMA has provided sufficient information to give confidence that the technology:

- is able to deal with all of the tailings volume
- can produce a filter cake of adequate residue moisture/consistency, and
- would operate without risk of critical failure.

**I am advised** that some belt presses used at other mines in the Queensland coal fields have not been able to consistently produce a dry cake and its dewatered tailings were still sufficiently fluid to require containment in a tailings dam.

DERM does not require the proponent to construct a tailings dam for the initial operation of the CRM. However, DERM does require the proponent to demonstrate that there is sufficient space on site to construct such a back up facility should the belt filter press not work as intended.

Furthermore, in the event that the belt press filter does not work as intended, or produces an unacceptably fluid residue, DERM advises that:

- the concept design for the conventional tailings storage facility provided by BMA indicates an insufficient size to contain the full mine production of an estimated seven million tonnes of tailings that would be produced each year
- BMA has provided insufficient information about the location, layout and design of the contingency conventional tailings storage facility.

Therefore, **DERM has advised** me that an EA for the mine could not be issued on the basis of information currently available.

## Conclusion

On the basis of advice from DERM, **I am not satisfied** that BMA has provided sufficient information to support confidence in the performance of the belt press filter technology.

**I find** that the information provided in the EIS, SEIS, and in correspondence between BMA, DERM and DIP does provide the basis for BMA to provide further evidence to justify its preference to use the belt press filter technology. **I do not consider** this issue to be an impediment to recommending that the CRM can proceed if BMA is able to provide sufficient information before the EA is issued by DERM.

Therefore, **I impose** Conditions 13(a), Schedule 1, Appendix 1 that require the proponent to provide to DERM, before the EA can be granted:

- sufficient evidence to justify the effectiveness and reliability of the proposed belt press filter technology (e.g. processing results from a statistically relevant sample of material that would be representative of the tailings to be produced at the mine), and
- the results and analysis of the pilot plant testing of the belt filter press at the Peak Downs mine.

**I support** DERM's position that if the residual shear strength of the dewatered tailings test at less than 1000 Pa, then the tailings must be disposed of to a regulated dam operated as a conventional tailings storage facility. Therefore, in consultation with DERM, **I state** Condition E6, Schedule 3, Appendix 1 that requires the proponent to dispose of waste from the CHPP to a regulated dam, operated as a conventional tailings storage facility, in the event that the residual shear strength of the dewatered tailings is less than 1000 Pa prior to disposal.

Furthermore, **I am not satisfied** that BMA has provided sufficient information to support confidence in its contingency tailings disposal strategy that requires a tailings storage facility



to be wholly located within the confines of the CRM site. Nonetheless, **I do not consider** this issue to be an impediment to recommending that the CRM can proceed if BMA is able to provide sufficient information before the EA is issued by DERM.

Therefore, **I impose** Condition 13(b), Schedule 1, Appendix 1, that requires, if DERM continues to be dissatisfied with the performance information of the proposed belt filter press technology provided by BMA, then the proponent must provide to DERM further evidence to justify the location, layout, design and capacity of the contingency conventional tailings storage facility that could accommodate tailings if the belt filter press produces cake with a shear strength of less than 1000 Pa, and provide design details, maps and associated documentation for the review and approval of DERM before the EA is issued.

**I note** that this requirement for more information about tailings management is analogous to the need for additional information about the mine water managements system described in sections 5.3.2 and 5.3.5 of this Coordinator-General's report.

**I support** imposed Condition 13(b) with a recommendation to DERM (Recommendation 4, Schedule 5, Appendix 1) that it does not issue the EA for the CRM to BMA until it has approved the matters specified under this condition.

In consultation with DERM, **I also state** the following conditions to be included in the EA Schedule 3, Appendix 1:

- Conditions E7 – E12 that require the proponent to locate, design, construct, operate and decommission/rehabilitate the spoil disposal stockpiles to a standard acceptable to DERM that minimises potential for environmental harm.
- Condition F12 that requires the proponent to develop and implement a mining waste management plan for the CRM.

## 5.2.4 Use of spoil for re-vegetation and rehabilitation

Given the mining proposal to dispose of all rejects and spoil material together back into the void, there will need to be some spoil set aside to ensure the rejects material is not near the surface of the stockpiles. Also, a small portion of the mine spoil will be contained in an out-of-pit stockpile, therefore, the suitability of spoil as a material for re-establishing vegetation was investigated (EIS, section 5.3). The results reported showed the spoil material is marginally sodic, or sodic with potential for dispersion (i.e. a higher potential for erosion to occur). In addition to potential dispersion problems, sodic soils are more likely to have macro-nutrient deficiencies and a range of physical characteristics that may limit plant survival and growth.

Therefore, the SEIS (section 5.5.2.1) found that mineral waste material cannot be used for rehabilitation for the CRM without treatment.

BMA's proposed management strategy includes testing ahead of mining and rehabilitation, selectively burying high sodic spoil, ensuring moderately sodic material is top-dressed with topsoil, and allowing low sodic material to be sown with native trees and shrubs without topsoil.

The requirement for BMA to provide a satisfactory level of mine site and spoil rehabilitation is discussed in more detail in section 5.1.3 of this report, and addressed by EA conditions F4 and F7-F9, Schedule 3, Appendix 1 that **I have stated** in consultation with DERM, and supplemented by Recommendation 1(b), Schedule 5, Appendix 1.

### Conclusion

**I conclude** that the spoil management measures described in section 5.5.2.1 of the SEIS, combined with the proposed EA conditions should be sufficient to achieve acceptable environmental outcomes with respect to CRM rehabilitation.



## 5.3 Surface water resource

Tributary streams of the Isaac River flow through the CRM site. These are located in the upper catchment of the Fitzroy River. All surface watercourses within the site are reported to be ephemeral watercourses. Nine Mile Creek and Caval Creek join Cherwell Creek within the mine site, while Harrow Creek forms the southern boundary of the site and joins Cherwell Creek downstream of the site. Horse Creek flows through the northern portion of the mine site, joining Grosvenor Creek downstream from the site. All of these creeks are shown in Figure 3 of this report.

The environmental objectives for the surface water environment include protection of slightly to moderately disturbed aquatic habitat, protection of the suitability for stock watering, protection of the suitability for farm use and protection of cultural and spiritual values (Cherwell Creek only - EIS section 6.1.1).

Existing water quality data presented in the EIS (Table 6.4) shows exceedances for turbidity, pH, nitrogen and phosphorus when compared to the *Queensland Water Quality Guidelines (2006)* water quality objectives.

### 5.3.1 Impacts from creek diversions

#### EIS findings, submissions and analysis

Caval Creek traverses an area proposed for the Horse Pit footprint and an area required for spoil placement. Two options for creek diversion were considered in the EIS (Appendix I2):

- a short-term diversion, where only the upper reach of Caval Creek is diverted (2.9 kilometres), and
- a long-term creek diversion, where the full creek reach within the mining lease is diverted (5.8 kilometres). This option is no longer under consideration by BMA. Should full creek diversion be required due to changes in mine planning, separate approval for a full creek diversion will be required.

The length of Horse Creek requiring diversion is 3.8 kilometres due to the existing creek interacting with the proposed Horse Pit footprint in the north.

BMA proposes to design the creek diversions on Caval Creek and Horse Creek in accordance with *Australian Coal Association Research Program (ACARP 2000)* standards<sup>8</sup>. Any diversions of Caval Creek and Horse Creek would require licences under the *Water Act 2000* to interfere with the flow of water.

The EIS (Appendix I2) outlined a creek diversion concept design and described a 50 metre buffer that has been allowed between the creek diversions and spoil stockpiles for drainage and sediment control infrastructure. Where the creek diversion is close to a lease boundary (as for Horse Creek), a 30 metre buffer has been allowed for construction and management activities. Table 2 provides key design details for the creek diversions concepts.

**Table 2: Key design details for creek diversions concepts**

Parameter	Caval Creek diversion	Horse Creek diversion
Total channel length (m)	5,257	4,590
Diversion grade (per cent)	Upper reach 0.3 – 0.4 Lower reach 0.7	0.38 (with meander)
Diversion base width (m)	Upper reach approx 4 Lower reach 10 – 15	20
Cut volume 1:4 bank side slope (m <sup>3</sup> )	517,000	327,600
Peak cut depth (m)	9	6 – 7

<sup>8</sup> Australian Coal Association Research Program (ACARP) (2000): *Maintenance of Geomorphic Processes in Bowen Basin River Diversions C8030 – Final Report*



The EIS provided information on hydrologic and hydraulic analyses of the proposed creek diversions in order to demonstrate compliance of concept design with relevant guidelines. The EIS (Appendix I2) stated that the proposed diversions are compliant with the appropriate guideline<sup>9</sup> stream conditions for the two-year average recurrence interval (ARI) vegetated scenario and for the 50-year ARI scenario. **I note** that neither of the proposed creek diversions are fully compliant with the criteria for the two-year ARI non-vegetated scenario, with the Caval Creek diversion achieving stream velocities in excess of one metre per second and the Horse Creek diversion exceeding both the velocity and stream power conditions.

The creek diversions are exposed to risk of failure immediately following construction as no vegetation would have established. BMA's proposed mitigation measures<sup>10</sup> to manage this risk are:

- construction of the diversions during the dry season, maximising the opportunity for the establishment of vegetation prior to significant flow events
- development of a diversion revegetation plan
- construction staging that maximises the time for vegetation establishment prior to the activation of the creek diversions
- development of a comprehensive diversion monitoring program with particular focus on monitoring of bed conditions following flow events.

**I note** that there are precedents for failure of stream diversions at Bowen Basin coal mines, including at Peak Downs Mine, so this is a matter that warrants attention. **I am advised** that past diversions have been constructed on Cherwell Creek for operation of the Heyford Pit at the Peak Downs Mine. **I am informed** that the most recent diversion failed and was required by DERM to be rehabilitated by BMA. **I am advised** that BMA intends to transfer responsibility for monitoring and reporting on the rehabilitated Cherwell Creek diversion from Peak Downs Mine to CRM.

In its submission on the EIS, DERM recommended that the design of creek diversions be in accordance with its guidelines for Watercourse Diversions - Central Queensland Mining Industry. Further, while the EIS only considered the reaches of the creeks that meet the definition of watercourse under the *Water Act 2000*, DERM requested that the entire portion of Horse Creek that needs to be diverted be considered. DERM recognised that there are spatial constraints in achieving the desired sinuosity in the Caval Creek diversion. DERM suggested the design should incorporate a slight meander and through increased monitoring and vegetation management, the creek should develop physical integrity characteristics similar to the existing water course.

**I note** that only diversion concept designs are presented in the EIS. BMA has undertaken to complete geotechnical investigations to inform the detailed design process.

**I acknowledge** the commitment from BMA to design and construct, in consultation with DEEDI, (Fisheries Queensland) any waterway barrier works in defined water courses that require approval under the *Fisheries Act 1994*.

## Conclusions

**I recognise** that there have been recent failures of stream diversions at Bowen Basin coal mines, including at Peak Downs Mine. I am advised that there may be other future mining activities near to the CRM (e.g. Anglo American Metallurgical Coal's Grosvenor mine). Therefore, **I recommend** in Schedule 4, Appendix 1 that the following conditions be attached to any licence, permit or approval required under the *Water Act 2000* for waterway diversions for the CRM:

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<sup>9</sup> Natural Resources and Water, Central West Water Management and Use Regional Guideline, *Watercourse Diversions – Central Queensland Mining Industry* (January 2008)

<sup>10</sup> EIS Appendix I2 – *SKM Stream Diversion Concept Report*, section 5.2.1

- Condition 6(a) that requires a meander to be incorporated into the diversion of Caval Creek.
- Condition 6(b) that requires the proponent to submit a plan that provides for increased monitoring and vegetation management that will allow Caval Creek to develop physical integrity characteristics similar to the existing watercourse.
- Condition 6(c) that requires BMA to provide independent written analysis to DERM that the final designs of all CRM creek diversions will not cause significant downstream environmental harm as a result of altered flow and flood patterns of those creeks.

**I also recommend** (Recommendation 3, Schedule 5, Appendix 1) that DERM ensures that any of its remaining environmental protection requirements for the rehabilitation of the failed existing Cherwell Creek diversion on ML1775 for the Peak Downs Mine be transferred to the CRM operations and be added to the CRM EA.

## 5.3.2 Mine water management system

### EIS findings, submissions and analysis

The objectives of the mine water management system (MWMS), as presented in the EIS (section 6.2.4), are to contain water from all areas disturbed by mining activities, prevent discharge to the receiving water environment and reuse all captured water where possible for dust suppression and process requirements in the CHPP. In the event that there is insufficient water available to meet these demands, BMA propose to source water from the Eungella-Bingegang pipeline. Water from the pipeline would be stored in the raw water dam.

The key element of the MWMS is a large dam of ‘turkey’s nest’ design. This central dam is known as the ‘12N Dam’ and it is designed to have a total capacity of 2,300 million (mega) litres (ML). The operational principles of the MWMS have been described by BMA as:

- Divert clean upstream catchment water away from areas disturbed by mining activities. This water will not be captured within the MWMS.
- Capture within the pits (via pit sumps) runoff from the cleared areas ahead of the mining pits that cannot practically be diverted away from the pit, runoff and seepage water from the pits, runoff from spoil stockpiles immediately adjacent to the pits and seepage from the spoil stockpiles. This mine water will be pumped from the pit sumps to mine water dams. The mine water dams will be designed to contain rainfall events of 72 hour, 1-in-100 year ARI, assuming 100 per cent runoff. Each mine water dam will be pumped to the 12N Dam to enable reuse of the mine water. These mine water dams have pumped inputs and pumped outputs. In the event that 12N Dam cannot accept any more inputs or there is a system failure, pumps will be stopped, resulting in the mine water continuing to accumulate within the pits. The mine water has the potential to contain elevated levels of salinity. There will be no discharge from the mine water dams or from the pits.
- Progressively rehabilitate spoil stockpiles. Runoff from spoil that has been regraded will be captured in sediment dams.
- Capture runoff from the haul roads in sediment dams.
- Design sediment dams to contain runoff from a 72 hour, 1-in-10 year ARI with spillway capacity of 1-in-100 year ARI (refer EIS Table 6.7). Following rainfall events, the water remaining within the sediment dams will be pumped to the 12N Dam for reuse. The capacity of the pumps will be sufficient to draw down the volume contained within 10 days. The sediment dams would then be available for maintenance activities such as removal of sediment.
- Capture sediment in runoff from the mine infrastructure area (MIA). Five industrial area dams are proposed with the same design as the sediment dams described above. While runoff collected in the industrial area dams will be pumped to 12N Dam as a priority, it is possible for overflows to occur in severe events.



- Discharge from one location to receiving water. The discharge will be controlled and only occur when EA discharge criteria are met. The only controlled discharge will be from 12N Dam, which will be designed with a spillway capacity of greater than 1-in-1,000 year ARI. 12N Dam will supply water to operate the CHPP, dust suppression of the ROM and raw coal stockpiles and haul road dust suppression.

The CRM has an overall water deficit. Raw water is required for certain uses such as the ROM bin demand and CHPP transfer towers. Captured water from 12N Dam will be used for all other uses. Raw water will be used to top up 12N Dam when necessary to ensure continued operation of the mine.

In its submission on the EIS, DERM requested details of the MWMS and discussion of the assumptions made in calculating the estimated storages required on site. The EIS (section 6.2.4.8) and supplementary information reported on the use of a 'Goldsim' water balance model for the mine that included the influence from contributing catchments, the volume of each of the storages, the pumping rate between them, and the priorities (pumping rules) in which they contributed to the central storage 12N Dam. The water balance model used 100 years of historical rainfall data for the area. The stated aim of the modelling was to demonstrate that the 12N Dam had an appropriate design storage allowance that would ensure a low probability of uncontrolled releases (overflow).

In its comments on the SEIS, DERM requested benchmarking of modelling against DME technical guidelines (1995)<sup>11</sup>. DERM required sufficient storage to be provided to contain contaminated site runoff and allow pumping out of the pits. Supplementary information provided by BMA reported results of the mine water balance modelling and demonstrated that in continuous operation over the 100 years of rainfall data available 12N Dam does not overflow with uncontrolled releases. The water balance modelling with respect to controlled and uncontrolled discharges is discussed further in section 5.3.5 of this report.

The SEIS reported that when conditions in the receiving environment allow, the model maintains 12N Dam at a volume of approximately 1900 ML. Therefore, using the water balance model, a design storage allowance of 400 ML is reportedly maintained and available on 1<sup>st</sup> November of each year in preparation for the wet season. In comparison, a design storage allowance of 348 ML was calculated for 12N Dam in the SKM Report (refer to Appendix 2 of this report) using the DME guidelines.

Although DERM required that pit water be kept separate from collected runoff in sediment dams, with the objective of effective management of saline water and potential leachate from spoil dumps, BMA proposed that the MWMS would combine pit water and water from the sedimentation dams in 12N Dam for reuse. **I am satisfied** that reuse of the pit water in the process water system is acceptable, provided that the salinity limits for discharging can be sustained. **I note** that pit water will not be pumped directly to sediment dams which have allowable overflows during certain rainfall events.

**I note** that in the SEIS (section 5.6.2.4) BMA committed to undertake system failure risk assessments during the detailed design phase of the MWMS. In addition, **I note** that BMA proposed to prepare system failure contingency plans (actions and strategies) to address potential failures of one or more components of the MWMS that cannot be eliminated through design. **I consider** that these two commitments would be integral components of a successful MWMS.

## Conclusions

**I consider** that the preparation of a water management plan in accordance with the DERM guideline '*Preparation of water management plans for mining activities*' (2009) is required to ensure the proper and effective management of the actual and potential environmental impacts on surface water values.

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<sup>11</sup> Department of Mine and Energy (January 1995): *Technical guidelines for the environmental management of exploration and mining in Queensland, site water management chapter*

**I consider** that the use of the mine water balance model, as the key operational tool to manage water for CRM, is appropriate given the specific MWMS principles described by BMA.

**I am satisfied** that the draft EA conditions provided in Conditions W32-W55, Schedule 3, Appendix 1 of this report will ensure that the suitable preparation, implementation and ongoing review of the CRM water management plan, water balance model and MWMS.

In consultation with DERM, **I state** the following conditions to be included in the EA:

- Conditions W32-W35, Schedule 3, Appendix 1 that require the proponent to develop a water management plan in accordance with the DERM guideline '*Preparation of water management plans for mining activities*' (2009).
- Conditions W44-W55, Schedule 3, Appendix 1 that require the proponent to develop, calibrate, and maintain a complete mine water balance model (coupled with a contaminant balance model) that adequately represents all sources of mine water contributing to all dams that comprise the integrated mine water system, mine pits, and operations of the mine water management system including controlled releases (where applicable).

**I note** that the SKM Mine Water Balance Report recommended that the operating procedures and pumping rates described for the MWMS be carried through to the detailed design stage to ensure that storage allowances are maintained and uncontrolled releases are prevented. It also recommends that water balance modelling be updated if and when revisions to the MWMS are necessary as the design progresses towards operational stage.

Therefore, in consultation with DERM, **I state** Condition W44, Schedule 3, Appendix 1 to ensure that the proponent adopts the principles of the MWMS, described in the EIS (section 6.2.4) and SEIS (section 5.6.2.4) in the design process for the MWMS, and updates the water balance modelling if and when requested by DERM.

In consultation with DERM, **I state** that the receiving environment release criteria, provided in the Conditions W18-W19, Schedule 3, Appendix 1, must be used for the water balance modelling and design of the components of the MWMS.

In consultation with DERM, **I state** Condition W47, Schedule 3, Appendix 1 that requires the proponent to undertake system risk failure assessments on the MWMS and prepare system failure contingency plans. BMA must ensure that the contingency plans do not allow an increase in frequency of uncontrolled discharges from the storage components of the MWMS and ensure that controlled discharges remain compliant with EA conditions.

### 5.3.3 Hazard assessment of dams

#### EIS findings, submissions and analysis

Section 6.2.3.1 of the EIS discusses failure of storages within the MWMS. BMA committed to the following:

- designing water storages using a water balance model and in accordance with the DME technical guidelines
- monitoring storage volume during operation
- design and supervision of construction of storages by registered professional engineer of Queensland
- regular inspection of water storage embankments by a registered professional engineer of Queensland
- regular inspections and maintenance of other components of the system such as pipes, drains, bunds, levees and pumps.

BMA completed a preliminary hazard assessment (SEIS, Appendix H1) in response to DERM's submission on the EIS. While neither BMA nor the QRC have endorsed DERM's draft *Manual for assessing hazard categories and hydraulic performance of dams* (version



1.1, June 2009), BMA considered that some of the aspects of the manual that relate to methods and criteria to determine hazard category are acceptable and applicable to the CRM.

## Conclusions

**I require** that dams and water storages on the CRM are appropriately located, designed, constructed and operated to avoid causing environmental harm. In consultation with DERM, **I state** the following conditions to be included in the EA:

- Conditions G1-G19, Schedule 3, Appendix 1 that require the proponent to provide dams and water storages in a manner that avoids causing environmental harm.

**I note** that Table G3 of the draft EA conditions provides hydraulic performance criteria for the dams with respect to annual exceedance probabilities.

### 5.3.4 Water supply

#### EIS findings, submissions and analysis

The EIS states that raw water will only be used for the ROM bin demand and dust suppression on the CHPP transfer towers. Raw water is then used to 'top up' process water demand and dust suppression demand by direct input to the 12N Dam. Water demand for the CRM includes the following:

- process water demand in the CHPP (three modules) – 7.0 ML/day
- ROM and raw coal stockpile dust suppression – 2.5 ML/day
- haul road dust suppression – 3.4 ML/day
- raw water for ROM bin and CHPP transfer towers – 1.8 ML/day.

BMA would require the ability to transfer water between the CRM and its Peak Downs operations if necessary. It may also be necessary to transfer water from the CRM site to third parties to meet 'make good' conditions on the CRM mining leases relating to impact of the mine on third party water supplies.

In its submission on the EIS, IRC sought to ensure that BMA had ensured a water supply adequate for dust suppression during very dry periods.

#### Conclusions

**I consider** that BMA's commitment (EIS, Appendix I3) to develop, implement and maintain a water supply strategy and emergency plan in order to mitigate the risk of inadequate water supply adequately addresses IRC's concerns about this issue.

Due to the importance of maintaining water supply to CRM, in particular for purposes of dust suppression, **I impose** Condition 2(a), Schedule 1, Appendix 1 that requires the proponent to develop, implement and maintain a water supply strategy and emergency plan.

In consultation with DERM, **I state** the following conditions to be included in the EA:

- Conditions W23-W27, Schedule 3, Appendix 1 that allow the proponent to transfer water from the CRM site to Peak Downs Mine and third parties, for stock watering, irrigation, construction and road maintenance purposes, and provides sufficient control over relevant water quality criteria.

### 5.3.5 Water released from the site

#### EIS findings, submissions and analysis

The design concept of the MWMS described in the EIS is to have no uncontrolled releases from the CRM site, with controlled releases from 12N Dam to Cherwell Creek only occurring when conditions in the receiving environment are suitable. A mine water balance model was set up to validate the concept design, storage sizing and operation of the MWMS to ensure the system could operate under the proposed specifications given wet and dry periods.

BMA referred to experience at the Peak Downs and Goonyella Riverside Mines to demonstrate that its integrated collection and transfer system produces water quality that is suitable for reuse. Contingency measures in the case where mine water quality becomes unacceptable are proposed to be developed and include improved mixing, segregation of waters and water treatment (SEIS section 5.6.2.6). Section 5.6.2.14 of the SEIS further describes the expected mine water quality (runoff from mine spoil and industrial area and pit water) and identifies that general salinity (as measured by electrical conductivity (EC)) is the contaminant of concern.

In the SEIS, BMA provided information on the data and analyses used to derive proposed controlled release criteria for salinity. This was in response to DERM's submission on the EIS that requested consideration of the studies<sup>12</sup> completed in response to Fitzroy River Basin water quality issues. These studies focussed on salinity as the contaminant of concern and recommended improvements to standardise the approach to licensing of discharges from mines across the Fitzroy Basin.

BMA's analysis of these studies also considered *Final model water conditions for coal mines in the Fitzroy Basin* (July 2009) and *Conditions for Coal Mines in the Fitzroy Basin – approach to Discharge Licensing* (Version 10 June 2009), both prepared by DERM. These documents set out the process to manage end-of-pipe discharge limits, especially in relation to specified upper limits for salinity (electrical conductivity) and receiving waterway flow conditions. The conditions under which a controlled release would be allowed by BMA operations were derived from these studies and documents.

Further modelling undertaken by BMA in March 2010, proposed the following conditions for controlled releases:

- upstream Cherwell Creek flow greater than or equal to 0.05 cubic metres per second ( $\text{m}^3/\text{s}$ ), measured at the Peak Downs Mine upstream gauge
- maximum release rate of 20 per cent of the upstream Cherwell Creek flow (1:5 dilution)
- maximum end of pipe EC for release of 3000 microsiemens per centimetre ( $\mu\text{S}/\text{cm}$ )
- maximum EC in Cherwell Creek downstream receiving waters of 1000  $\mu\text{S}/\text{cm}$ .

The revised mine water balance modelling indicated that using the past 100 years of rainfall data from the area and the release criteria above, no uncontrolled releases occurred from the 12N Dam. Of the total of 36,525 simulated days, the model predicted releases on 1000 individual days. The release time series shows that releases may not occur for several years, and then become necessary during a particularly wet season. The modelling showed that no maximum volume of release limit is required, provided the release criteria are met. However, a maximum of 300 ML/day is proposed by BMA as this is the volume of water that would bring the almost full 12N Dam back to its operating level of 1900 ML/day.

The water balance modelling undertaken also incorporates salt mass balance to ensure assumed release criteria are met. Results of this analysis show peaks in receiving water salinity during controlled releases, although the modelled salinity levels do not exceed 750  $\mu\text{S}/\text{cm}$ .

In its submission on the SEIS, DERM provided draft conditions for the EA which required an EC of 1000  $\mu\text{S}/\text{cm}$  in both the release from site (one third of BMA's proposal), and the receiving environment. These draft conditions also proposed to limit controlled releases to times when the upstream flow in Cherwell Creek is greater than 1.0  $\text{m}^3/\text{s}$  (rather than the 0.05  $\text{m}^3/\text{s}$  assumed by BMA).

In April 2010, DIP expressed concern to BMA and DERM that the modelling undertaken by BMA was completed using assumptions about requirements in the draft EA conditions that did not correspond with the draft EA conditions provided by DERM at that time. Furthermore, DIP expressed concern that BMA was proposing to release mine water with substantially higher salinity than would be usually permitted in similar circumstances, and more frequently than

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<sup>12</sup> *Review of the Fitzroy River water quality issues (November 2008)*, and *Study of the cumulative impacts on water quality of mining activities in the Fitzroy River Basin (April 2009)*



would be allowed in the draft EA conditions. Therefore, significant elements of the CRM MWMS (e.g. the 12N Dam) may be undersized and not acceptable to DERM.

In May 2010, after ongoing discussions, BMA presented a new analysis based on an 1800  $\mu\text{S}/\text{cm}$  end of pipe discharge limit with an upstream flow rate of  $0.5 \text{ m}^3/\text{s}$  (refer to URS Report – Appendix 3 of this report).

In response, DERM still considered that the model proposed by BMA would not adequately protect the environmental values of the receiving waters, nor would it be consistent with the government's position on discharges from mines in the Fitzroy Basin. DERM further considered that there may be scope for raising the limit on the electrical conductivity of the discharge water to  $1500 \mu\text{S}/\text{cm}$ , but the proponent would need to assess how the increase would impact on the environment and commit to satisfactory environmental protection measures.

DERM's final recommended draft conditions for the EA required an EC of  $1000 \mu\text{S}/\text{cm}$  in both the release from site (one third of BMA's proposal), and the receiving environment, and a minimum acceptable receiving flow rate for permitted releases of  $0.5 \text{ m}^3/\text{s}$ .

Furthermore, DERM was prepared to consider BMA's proposal of an  $1800 \mu\text{S}/\text{cm}$  end of pipe discharge limit with an upstream flow rate of  $0.5 \text{ m}^3/\text{s}$  should BMA provide a sufficiently detailed technical business case.

## Conclusions

**I conclude** that the approach to discharge licensing for the Fitzroy River Basin recommended by DERM should apply to the CRM.

Consequently, in consultation with DERM, **I state** the following conditions to be included in the EA:

- Conditions W2-W15, Schedule 3, Appendix 1 that provide the proponent with conditions and parameters for controlled water release to Cherwell Creek. Of note, these conditions include:
  - Table W2, Contaminant release, which limits end of pipe discharge salinity to  $1000 \mu\text{S}/\text{cm}$
  - Table W4, Contaminant Release during Flow Events, which limits the minimum upstream flow rate  $0.5 \text{ m}^3/\text{s}$
- Conditions W44-W55, Schedule 3, Appendix 1 that provide the proponent with conditions and parameters for uncontrolled releases.

**I do not accept** BMA's justification for controlled release to Cherwell Creek of an  $1800 \mu\text{S}/\text{cm}$  end of pipe discharge limit with an upstream flow rate of  $0.5 \text{ m}^3/\text{s}$ . However, **I accept** that DERM is prepared to consider these water release parameters should BMA provide a sufficiently detailed technical business case. **I recommend**:

- (Recommendation 4(b) Schedule 5, Appendix1) - that the methodologies outlined in the *"Final model water conditions for coal mines in the Fitzroy Basin" (July 2009)* and *"Conditions for Coal Mines in the Fitzroy Basin – approach to Discharge Licensing" (Version 10 June 2009)*, be followed by DERM and BMA to review BMA's proposed discharge limit of  $1500 \mu\text{S}/\text{cm}$ , and
- (Recommendation 4(c) Schedule 5, Appendix1) - any limit above  $1500 \mu\text{S}/\text{cm}$  be considered by DERM only following submission by BMA of a very detailed technical business case.

**I also impose** Condition 2(b) Schedule 1, Appendix 1 that requires the proponent to report to DERM prior to the EA being issued for the CRM, the following:

- details of all the assumptions used in the water balance model
- an explanation of how water quality predictions were derived



- a reassessment of the design storage allowance for the containment of contaminated run-off and pump out of pits for an annual exceedance probability (AEP) of 0.05 in the wet season.

Any comments provided by DERM to BMA on the review of the controlled water release report shall be considered by BMA for inclusion in the revised EM plan.

Furthermore, **I impose** Condition 2(c), Schedule 1, Appendix 1 requiring that, prior to issuing an EA, DERM reviews and endorses any design changes to water supply, storage and transfer components of the CRM MWMS to be sure that those structures can be adequately accommodated within the available space of the CRM mining lease.

**I note** that this requirement for more information about the mine water managements system is analogous to the need for additional information about tailings management described in sections 5.2.2 and 5.2.5 of this Coordinator-General's report.

## 5.3.6 Flooding

### EIS findings, submissions and analysis

BMA developed a one-dimensional hydraulic model for the major water courses within the CRM site with the objective of describing the flood extents for a range of design probability events (Appendix I4 of EIS). Peak flood flows for a range of flood events up to the 100 year ARI were assessed in the EIS (section 6.1.2.3) using the 'Rational Method'<sup>13</sup>. The potential for flood flows to break the banks of the water courses poses a risk to the health and safety of construction and operation workforce. In addition, flooding has the potential to cause erosion, to transport contaminants and to cause operations to slow or cease.

Information provided in the EIS (section 6.2.3.3) indicated that, with respect to the impact on flooding from proposed creek diversions:

- the design channel for the Horse Creek diversion has the capacity for a 100 year ARI flood event
- the haul road adjacent to the Horse Creek diversion protects the Horse Pit from flooding
- the Caval Creek diversion has the capacity to contain flows up to 100 year ARI events within the channel banks
- haul road crossing locations on creeks have limited capacity to cope with larger flood flows and this will result in increased flood depths and extents around the culverts.

To mitigate the risk of flooding, BMA proposed emergency response procedures and a flood warning system to protect onsite personnel. Infrastructure such as offices and storage sites for hazardous materials would be constructed and protected above 100 year ARI (SEIS section 5.6.2.1).

#### 5.3.6.1 Protection of pits during operations

In its submission on the EIS, DERM required a detailed assessment of effects from inundation of the site from at least 1-in-500 year AEP event. Additional flood analysis was undertaken for rare (1-in-500 year ARI) and very rare events up to 1-in-3000 year ARI (Appendix H2 of SEIS). BMA committed to constructing levees on Horse Pit and Heyford Pit to provide protection from floods for at least the 500 year ARI event (SEIS section 5.6.2.13). BMA also advised that detailed flooding analysis would be undertaken during the detailed design phase and the priority would be to protect mine pits from flooding. A map and cross section was provided by BMA to demonstrate that levees can provide flood protection to mine pits for an event up to 3000 year ARI when incorporated into the design of the pit.

BMA committed in the SEIS to mitigating any residual flood risk to the environment where necessary by:

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<sup>13</sup> The 'Rational Method' expresses a relationship between rainfall intensity and catchment area as independent variables and the peak flood discharge resulting from the rainfall as the dependent variable.



- rescheduling operations and drawing the water in the pits down through the CHPP
- repairing levees and any resulting erosion.

DERM has advised that BMA has not provided sufficient information to demonstrate that there is enough space available on-site to construct operational flood protection to acceptable engineering standards. DERM considered that the design of flood protection levees should clearly show a profile of suitable height and stable batter slopes could maintain acceptable separation distances from both the pits and watercourses.

## Conclusions

**I impose** Condition 2(d), Schedule 1, Appendix 1 requiring that, prior to issuing an EA, DERM reviews and endorses for inclusion in the EM plan any design of the CRM operational flood protection levees to be sure that those structures can be adequately accommodated within the available space of the CRM mining lease.

### 5.3.6.2 Flood protection for post-mining landforms

In its submission on the SEIS, DERM requested a detailed assessment of measures to protect the final voids from the probable maximum flood (PMF) and requested the rehabilitation and decommissioning section of the draft EM plan to be updated to include measures that would ensure the water quality of the Fitzroy River Basin was protected in the long term.

BMA has provided a discussion of options available for decommissioning of final voids (Appendix 2 of this report). As optimal final void configurations can change depending on further work to be completed during the mine life, BMA has committed to ensuring that risks associated with events up to a PMF event are considered as part of closure design and planning with the objective of maintaining stability and sustainability of not only the final voids but all mine constructed final land forms.

## Conclusions

**I am satisfied** with BMA's commitment to manage risks associated with floods up to a PMF event as part of mine closure design and planning.

In consultation with DERM, **I state** Condition F6, Schedule 3, Appendix 1 that includes a provision requiring BMA to consider risks associated with floods up to a PMF event as part of closure design and planning in the CRM EM plan.

### 5.3.7 Post-mining water storage and quality in final voids

#### EIS findings, submissions and analysis

The final voids will collect and accumulate water from groundwater ingress through the walls of the final void and from areas of backfill material. In addition, direct rainfall into the void and from overland surface flows from the slopes of the spoil stockpiles will also collect. Typically, the final voids will contain long-term water levels and water quality dependent on a number of inter-related hydrological and geochemical processes (EIS section 7.2.2).

A final void study was not conducted by BMA as part of the EIS. However, as a result of comments by DERM on the EIS, further information was provided in the SEIS on drainage and landform aspects post-mining (Appendix E2, Long Term Void Water Storage and Quality). The void storage behaviour was modelled for two drainage scenarios: minimum catchment, where only runoff from areas that slope to void reported to the final void, and maximum catchment, where all spoil area runoff reports to final void. Results showed no spill from the final voids occurred in the modelled 100 year period, including extreme event modelling. BMA advised that all spoil in the mined areas (other than box cut spoil) would be placed in pit on dipping shales and thus any seepage would progress to the final void. Hence, final void water quality would become progressively saline. However, as modelling showed no spillages from the voids would occur, the potential for environmental harm was considered by BMA to be low.

In its submission on the SEIS, DERM considered the surface water coefficients used in the pit water balance model as inappropriate and these could potentially lead to under estimation of long term equilibrium levels of water in pits. As a result of discussions between BMA and DERM, it was agreed that detailed final void water balance modelling could be undertaken at the time that final void options are investigated.

## Conclusions

**I consider** that a water balance model for final void configuration will be an integral component of mine closure planning.

Section 5.4.1, Impact on groundwater of this report addresses the final design and management of the final void based upon any significant changes to groundwater characteristics or other data that becomes available from the groundwater monitoring program.

### 5.3.8 Receiving water monitoring

#### EIS findings, submissions and analysis

It is current State Government policy that the water quality guidelines for the receiving environment should be used only for triggering investigations and reporting rather than being used as a primary mechanism for regulation<sup>14</sup>. That is, if downstream water quality monitoring indicates levels of contaminants over trigger limits, an investigation is required to compare upstream water quality data and downstream water quality data.

DERM requires monitoring of the receiving environment to record effects of controlled and uncontrolled discharges on the receiving environment. Receiving environment monitoring may also detect other impacts such as sedimentation due to creek diversions or other land disturbance. BMA outlined a receiving environment monitoring program in section 5.6.2.17 of the SEIS and the draft EM plan covers this issue.

## Conclusions

In consultation with DERM, **I state** the following conditions to be included in the EA:

- Condition W18, Schedule 3, Appendix 1 that requires the proponent to monitor the quality of the receiving environment at locations both upstream and downstream of the proposed controlled release site.
- Condition W19, Schedule 3, Appendix 1 that requires the proponent to conduct an investigation into potential for environmental harm where contaminant concentrations exceed nominated trigger levels.
- Conditions W20-W22, Schedule 3, Appendix 1 that require the proponent to prepare a receiving environment monitoring program in accordance with DERM requirements.

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<sup>14</sup> *DERM Conditions for Coal Mines in the Fitzroy Basin – Approach to Discharge Licensing (June 2009)*



## 5.4 Groundwater resources

### EIS findings, submissions and analysis

#### 5.4.1 Impacts on groundwater

The main factors influencing natural groundwater levels are groundwater recharge, evapotranspiration and regional flow patterns (EIS section 7.1.2). Groundwater extraction in an area can also influence the natural levels. Sixteen groundwater monitoring wells installed onsite were accessed for monitoring over a period of 10 months.

The CRM site is within the Highlands Declared Subartesian Area. For uses other than stock and domestic supply, all wells are required to be licensed by DERM under the *Water Act 2000*. According to the EIS, local groundwater use is primarily for livestock watering purposes owing to the variable salinity levels and generally low yields (EIS section 7.1.3).

The EIS concluded that due to the large depths to groundwater and the lack of springs in the area, it is unlikely that groundwater dependent ecosystems exist in the vicinity of the site (EIS section 7.1.5.1). In general, the groundwater is unsuitable for human consumption however some samples showed the groundwater may generally be suitable for stock watering. The quality of groundwater was considered more suitable to industrial uses, however the low yield may preclude this use.

The main aquifers in the area are associated with the coal seams. From BMA's experience at Peak Downs Mine, inflow from the seams to the pits has not been significant. However, significant groundwater inflow to the CRM pits may cause drawdown in groundwater around the pits causing the regional groundwater levels to lower. After mining has finished, groundwater will continue to flow in to the final voids until levels recover to a new equilibrium. The radius of influence of groundwater drawdown for CRM is expected to be around 1,800 metres, as is the case for Peak Downs Mine.

The EIS stated that thirteen groundwater bores have been installed and registered with DERM within a 10 kilometre radius of the proposed mine site. Of the 13 groundwater bores installed, nine have been installed for private use and four have been installed by DERM for groundwater monitoring and assessment. The EIS further states that no information on sustainability of the bore yields is available.

The SEIS states that the simulated drawdown of groundwater in the Permian coal seam formations is predicted to extend up to 1,800 metres from the mine site and further that no neighbouring bores are located within the predicted zone of influence. The SEIS also states that as these aquifers are low yielding and contain poor quality (high salinity) groundwater, the potential for future use is limited.

No impact on groundwater quality was predicted due to expected groundwater drawdown during operations and post mining as the pits and void act as a groundwater sink. As discussed in section 5.2.1 of this report, acid generation from mine waste is not expected to be an issue for CRM.

Additional impacts that may occur to groundwater as a result of developing the CRM include compression of ground surface altering the permeability of the underlying strata, contamination by chemical and fuel spillage. These impacts are not expected to be significant.

An increase in final void salinity is expected due to evaporation and concentration of salts.

In its submission on the EIS, DERM requested a hydrogeological investigation to assess impacts of post-mining dewatering. In response, BMA prepared the Long Term Void Water Quality report (SEIS, Appendix E2) and the Final Void Study (SEIS Appendix E1) which reports on the groundwater model used to assess the final void, and this is discussed in section 5.7.2.5 of the SEIS).

BMA has committed to updating the final void model as new information is collected. BMA has also committed to entering into agreements with neighbouring landholders whose water

supply is demonstrated to be affected by the CRM after closure. The mechanism for this is available through the *Water Act 2000*.

## Conclusions

**I accept** that determination of the design and other arrangements for final voids is best completed after an adequate base of groundwater data has been assembled during the operation of a mine. Therefore, in consultation with DERM, **I state** Condition F5, Schedule 3, Appendix 1 requiring that a revised final void model be prepared for approval by DERM five years after commencement of operation of the CRM and be subject to review each five years thereafter based on any changes to groundwater or other relevant data that becomes available from the groundwater monitoring program described in Conditions W62-W70, Schedule 3, Appendix 1.

**I accept** that there is limited likelihood that the CRM will have a negative impact on the quantity or quality of bore water supply to surrounding users. Nonetheless, **I consider** that it is reasonable for BMA to compensate such users if monitoring demonstrates that such an impact is occurring. Therefore, in consultation with DERM, **I recommend** Condition 7 (Schedule 4, Appendix 1) requiring such compensation if required. In accordance with the discussion in section 4.1 of this report, **I note** that this matter cannot be a condition of the EA for the CRM, as the head of power for such matters is contained within the *Water Act 2000*, not the EP Act.

### 5.4.2 Groundwater monitoring

#### EIS findings, submissions and analysis

A general groundwater monitoring program was outlined in the EIS (section 7.2.3.1). BMA committed to review the monitoring program yearly to evaluate its effectiveness and to continually improve it. BMA has proposed the installation of monitoring bores down gradient from seepage sources to enable early detection of leachate entering aquifers.

In its submission on the EIS, DERM requested a detailed description of the proposed groundwater monitoring program. In response, BMA prepared a groundwater monitoring plan (SEIS, Appendix J). **I note** that BMA's groundwater monitoring plan proposed monthly monitoring of groundwater levels in all groundwater bores for the first two years. After that, quarterly monitoring is proposed for groundwater levels. Quarterly groundwater sampling from all bores for various parameters was proposed. All data collected is proposed to be used to calibrate groundwater modelling in preparation for mine closure.

The stated reasons for what BMA refers to as a 'conservative approach' in groundwater monitoring included:

- the need to establish full baseline conditions
- potential for changes in the mining sequence or other activities necessitated a more precautionary approach
- the need for a consistent approach to groundwater monitoring.

In comparison, **I note** that the draft EA conditions provided by DERM recommended a groundwater monitoring program be developed, implemented and reviewed on an annual basis by a qualified and experienced hydrogeologist. It stipulated:

- monthly monitoring at locations to be identified by the proponent
- fluctuations in groundwater levels of more than two metres to be reported to the administering authority
- if the groundwater quality parameters measured as part of the monitoring program exceed any of the allowable contaminant trigger levels, then an investigation must be completed by the proponent and the administering authority notified
- the completion of a background groundwater monitoring program, involving monthly sampling (at least 12 samples), the results of which would be used to determine the



allowable contaminant trigger levels (note: this background groundwater monitoring program will inform development and operation of the ongoing groundwater monitoring program).

In its response to DERM on the draft groundwater conditions<sup>15</sup>, BMA requested:

- a reduction in sampling frequency for the background groundwater monitoring program from monthly to every two months
- a reduction in the number of samples required for the background groundwater monitoring program from 12 to eight
- that the monitoring frequency during the ongoing groundwater monitoring program be determined during the background groundwater monitoring program.

DERM considered BMA's request to amend the previously recommended monitoring conditions related to establishing the background quality of groundwater. While the proposal by the proponent to use only eight groundwater sampling events to establish the background quality would be insufficient, there is room for some flexibility. DERM considers that a minimum set of 12 groundwater sampling events, no more than two months apart over a 24 month period, would be required to establish the background quality of groundwater, and eighteen sampling events would be preferable.

## Conclusions

The conditions that **I state** in consultation with DERM with respect to groundwater monitoring are W62-W70, Schedule 3, Appendix 1.

After considering the issues in relation to the background groundwater monitoring program, **I agree** with DERM that the proponent must undertake sampling for the background groundwater monitoring program involving collection of at least 12 sampling events (no more than 2 months apart over a 2 year period). Therefore, in consultation with DERM, **I state** condition W63(b), Schedule 3, Appendix 1 be included in the EA that requires this frequency of sampling during background groundwater monitoring.

**I consider** that the background groundwater monitoring program provides sufficient information to assist in determining the required frequency of monitoring at nominated locations during the ongoing groundwater monitoring program. Therefore, in consultation with DERM, **I state** Conditions W63(c) and W64, Schedule 3, Appendix 1 that requires the proponent to use the results of the background groundwater monitoring program to inform the ongoing monitoring program in terms of frequency of monitoring at the nominated locations, and the contaminant trigger levels.

In Schedule 3, Appendix 1, **I also state** Conditions:

- W65 that requires a suitably qualified and experienced hydrogeologist to review the monitoring program annually
- W68 that requires that draw down fluctuations in excess of two metres per year must be notified by BMA
- W70 that requires an investigation by BMA if the contaminant trigger levels are exceeded.

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<sup>15</sup> BMA letter to DERM, dated 24 March 2010, subject: Caval Ridge SEIS – BMA response to DERM Draft Groundwater Conditions

## 5.5 Ecology (terrestrial and aquatic)

### 5.5.1 Terrestrial flora

#### EIS findings, submissions and analysis

The following section provides my analysis of terrestrial and aquatic ecological values of state significance that may be affected by the proposed Caval Ridge Mine (CRM). For further discussion on matters of national environmental significance (MNES), see section 7 of this report.

A total of 176 flora species was recorded during ground surveys for the EIS. No flora species listed as significant under the provisions of the *Nature Conservation Act 1992* (NC Act) were recorded within the CRM site.

Desktop analysis and ground-truthing identified ten mapped remnant regional ecosystems (REs) under the *Vegetation Management Act 1999*<sup>16</sup> (VM Act) present on the CRM site. Three REs are classified endangered, three are of concern and four are of least concern. RE 11.8.11 is classified as of concern under the VM Act but is classified as an endangered ecological community (EEC) under the EPBC Act ('natural grasslands').

Ground-truthing of the REs was undertaken for the EIS. Predictions of the area of each RE present on site that were originally intended to be cleared are provided in Table 3.

In addition to the status of each RE classified under the VM Act, **I have also accounted** for the 'Biodiversity status' of each RE, which is based on an assessment of the condition of remnant vegetation in addition to the pre-clearing and remnant extent of an RE, and which is subsequently used to determine its class under the VM Act.

In summary, the areas of REs to be cleared, aggregated by VM Act status are:

- total — 779.2 hectares
- least concern — 373.9 hectares
- of concern — 377.7 hectares
- endangered — 29.9 hectares.

This corresponds to 29.9 hectares of 'endangered' brigalow woodland RE, 124.6 hectares of 'of concern' natural grasslands RE and 253.1 hectares of 'of concern' poplar box woodland RE.

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<sup>16</sup> Sections 22LA, 22LB and 22LC of the VM Act provide and define three categories of regional ecosystems: endangered, of concern and least concern. The classification of 'major vegetation groups' is provided in *Australia's Native Vegetation – A Summary of Australia's Major Vegetation Groups* (DEWHA, 2007).



**Table 3: Original estimates of REs to be cleared (based on EIS Table 8.4)**

RE	RE description	VM Act status	Biodiversity status	EPBC Act status	Area to be cleared (ha)
11.3.2	Poplar box: <i>Eucalyptus populnea</i> woodland on alluvial plains	of concern	of concern	N/A	248.6
11.3.25	Forest red gum / river red gum: <i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland in Cainozoic clay plains	least concern	of concern	N/A	31.5
11.4.2	Poplar box: <i>Eucalyptus</i> spp. and/or <i>Corymbia</i> spp. grassy or shrubby woodland on Cainozoic clay plains	of concern	of concern	N/A	4.5
11.4.8	Brigalow: <i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains	endangered	endangered	endangered	8.2
11.4.9	Brigalow: <i>Acacia harpophylla</i> shrubby open forest to woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	endangered	endangered	endangered	17.8
11.5.3	<i>Eucalyptus populnea</i> and/or <i>E. melanophloia</i> and/or <i>Corymbia clarksoniana</i> on Cainozoic sand plains/remnant surfaces	least concern	no concern at present	N/A	100.0
11.5.9	<i>Eucalyptus crebra</i> and other <i>Eucalyptus</i> spp. and <i>Corymbia</i> spp. woodland on Cainozoic sand plains/remnant surfaces	least concern	no concern at present		217.3
11.8.5	<i>Eucalyptus orgadophila</i> open woodland on Cainozoic igneous rocks	least concern	no concern at present	No concern at present	25.1
11.8.11	Natural grasslands: <i>Dichanthium sericeum</i> grassland on Cainozoic igneous rocks	of concern	of concern	endangered	124.6
11.9.5	Brigalow: <i>Acacia harpophylla</i> and/or <i>Casuarina cristate</i> open forest to woodland on fine grained sedimentary rock	endangered	endangered	endangered	3.9
<b>Total</b>					<b>779.2</b>

**I note** that part of the amount to be cleared is 31.5 hectares of forest red gum/river red gum RE 11.3.25 present on the CRM site, which is a riparian/riverine eucalyptus woodland that has a VM Act status of 'least concern', but due to its habitat and connectivity values has a higher Biodiversity status of 'of concern'.

The vegetation of the CRM site is generally disturbed by active grazing, weed infestations, and infrastructure and modifications such as vehicle tracks, fences, dams and windmills. The majority of the area proposed to be mined is non-remnant vegetation and is currently grazed.

The areas of brigalow and poplar box woodlands intended to be cleared were identified in the EIS to be highly disturbed and in poor condition, mainly due to infestation by buffel grass (*Cenchrus ciliaris*). The areas of natural grasslands intended to be cleared were heavily infested with parthenium weed (*Parthenium hysterophorus*). The areas of both brigalow and natural grasslands intended to be cleared were assessed in the EIS to be relatively small, fragmented and isolated due to historical land use, and of poor ecological condition.



The CRM would require the clearing of remnant native vegetation to enable construction of the overland transport conveyor, mine pits, mine infrastructure, and road and rail transport corridors.

Clearing of native vegetation may result in direct loss of plant species, and the reduction and fragmentation of wildlife habitats and populations. Secondary impacts on vegetation may occur as a result of dust, erosion, altered water flows, weed invasion, soil exposure, and increases in herbivory and light penetration.

In its submission on the EIS, DERM considered that the EIS and draft EM plan should consider alternative locations to those mine components that could be located outside endangered and remnant ecosystems. BMA subsequently redesigned and relocated the coal conveyor corridor in the southern area of the CRM site to minimise clearing impacts and avoid habitat fragmentation. This resulted in a decrease in the area of brigalow RE 11.4.9 identified for clearing by 2.3 hectares (i.e. clearing area reduced from 17.8 to 15.5 hectares).

The areas proposed to be cleared are on the land subject to an existing mining lease (ML1775) on which all but small areas are presently subject to various 'surface area approvals' under the *Central Queensland Coal Associates Agreement Act 1968* and the *Mineral Resources Act 1989*. ML1775, in its entirety, is the subject of an EA granted pursuant to the *Environmental Protection Act 1994* for the carrying out of mining activities.

Land on ML1775 would have been cleared as part of normal mining associated with the Peak Downs Mine. The Caval Ridge Mine brings this clearing forward.

The areas that do not have existing approval for clearing are less than the total area to be cleared. Table 4 identifies the areas of each RE with no existing approval for clearing, recalculated following reconfiguration of the conveyor corridor.

**Table 4: Extent of disturbed REs (based on EIS Table 8.4, recalculated following SEIS)**

RE	VM Act Status	Area in CRM site (ha)	Area to be cleared (ha)	Area with existing approval (ha)	Area with no existing approval (ha)
11.3.2 Poplar box	of concern	351.8	248.6	140.3	108.3
11.3.25	least concern	75.9	31.5	0	31.5
11.4.2 Poplar box	of concern	4.5	4.5	0	4.5
11.4.8 Brigalow	endangered	10.1	8.2	0	8.2
11.4.9 Brigalow	endangered	92.1	15.5	3.1	12.4
11.5.3	least concern	245.5	100.0	0.5	99.5
11.5.9	least concern	259.4	217.3	37.9	179.4
11.8.5	least concern	255.0	25.1	6.8	18.3
11.8.11 Grassland	of concern	153.1	124.6	0	124.6
11.9.5 Brigalow	endangered	31.7	3.9	3.9	0
<b>Total</b>		<b>1479.1</b>	<b>779.2</b>	<b>192.5</b>	<b>586.7</b>

Note: 'Area requiring offset' is the 'area to be cleared' less the 'area with existing approval' for clearing.

In summary, the areas of REs to be cleared that do not have existing approvals, aggregated by VM Act status, are:

- total — 586.7 hectares
- least concern — 328.7 hectares



- of concern — 237.4 hectares
- endangered — 20.6 hectares.

This corresponds to 20.6 hectares of 'endangered' brigalow woodland, 124.6 hectares of 'of concern' natural grasslands and 112.8 hectares of 'of concern' poplar box woodland.

It is arguable that, as the CRM is a newly configured mine proposal and that most other conditions of the previous mine approval are subject to review as part of this new EIS process, then previous approvals to clear vegetation should no longer be exempt from offset requirement calculations. However, **I consider** that it would be inappropriate to retrospectively apply new offset requirements to previous clearing approvals. In reaching this view, **I have noted** that the quality of the vegetation communities proposed to be cleared is generally poor.

Clearing of vegetation for mining activities on a mining lease is not an assessable development under the Sustainable Planning Act 2009 (SPA) and therefore the *Brigalow Belt and New England Tableland Regional Vegetation Management Code (2009)* and the *Queensland Policy for Vegetation Management Offsets (2009)* do not apply to vegetation clearing on mining lease areas, although any clearing activities outside the mining lease are still assessable.

However, in my consideration of environmental offsets, **I have regard** to the intent of the Regional Vegetation Management Code and the Policy for Vegetation Management Offsets. I also recognise the intent to apply the Queensland Government Draft Biodiversity Offsets Policy (2009) to significant projects assessed under the SDPWO Act, and level 1 mining activities under the EP Act. Therefore, **I also have regard** to the Biodiversity status of the REs expected to be cleared for the CRM in recognition of the habitat and connectivity values of riparian eucalyptus woodland ecosystem.

In its submission on the EIS, DERM noted that a permit for removal of protected plants under the NC Act would still be required for clearing on the mining lease areas.

The EIS, SEIS and EM plan describe the management strategies to be implemented during construction and operation of the mine to minimise the impact on the remnant vegetation. These include:

- minimising area being cleared to what is necessary for the safe construction and operation of the mine
- implementing a 'permit to disturb' procedure onsite
- identifying go/no go areas on the CRM site
- dust suppression techniques
- providing offset vegetation similar to the vegetation being cleared as part of a coordinated and managed plan.

In the EIS, SEIS and EM plan, BMA committed to a progressive rehabilitation management plan of disturbed areas to ensure the long-term re-establishment of ecosystems and habitats. The rehabilitation commitments are to be included in the CRM EM plan.

The EM plan also proposes monitoring of terrestrial flora to be implemented during both construction and operation, and includes regular mapping of distribution of declared and environmental weeds, erosion and sedimentation influencing vegetation and stream health, health of downstream riparian habitat, habitat rehabilitation, and dust effects on native vegetation.

## 5.5.2 Offsets

### EIS findings, submissions and analysis

In its submission on the EIS, DERM considered that the revised draft EM plan should propose offsets that are viable in the long-term and in accordance with the Queensland Government's Environmental Offsets Policy, June 2008, for the loss of ecological values.

BMA has committed to develop and implement a biodiversity offset strategy (EIS section 5.4.4; SEIS, Appendix A2) to address the objectives of state and Commonwealth legislation and policy requirements for biodiversity offsets, in consultation with relevant agencies.

BMA's proposed Biodiversity Offset Strategy is included as Appendix 4 of this report. The proposed offset strategy adopts, as a minimum requirement, an offset ratio of 1:2.5, based upon a number of criteria, including the minimum offset ratio required by the *Queensland Policy for Vegetation Management Offsets* (2007) that is superseded by the *Policy for Vegetation Management Offsets* (2009) that does not prescribe offset ratios.

To complement the biodiversity offset strategy, BMA has committed to develop and implement a biodiversity offset management plan (EIS section 5.4.4) to manage the offsetting of cleared REs that could not otherwise be avoided or mitigated. The initial biodiversity offset management plan proposed in the SEIS (Appendix A3) had the following objectives:

- identify suitable offset areas with ecological values analogous to EPBC-listed EECs (brigalow and natural grasslands)
- assess the ecological value and equivalence of offsets to ensure comparable offset extent, species assemblage, floristic structure and ecological integrity utilising an appropriate biometric methodology
- develop appropriate management prescription to ensure long term viability of offsets (such as pest control, livestock management, access exclusion, ameliorative plantings and fire regime management)
- develop appropriate covenants for the future conservation and management of offsets
- develop appropriate monitoring and maintenance activities and performance review process to ensure long term viability of offsets.

As part of its initial fulfilment of these environmental offset commitments, BMA submitted to DIP on 28 April 2010 an initial draft *Proposed Biodiversity Offset Strategy – Caval Ridge Mine* (CRM Offset Strategy), which was revised on 20 May 2010 (version D) and is attached as Appendix 4 of this report.

The package of proposed offsets is summarised in Table 5 below.

**I note** that the effective offset ratio proposed for each RE exceeds the minimum 1:2.5 ratio propose in BMA's offset strategy.

**Table 5: Summary of BMA's proposed Biodiversity Offset Strategy ( Appendix 4 of this report).**

RE description	Offset description	Vegetation offset source area (ha)	Clearing to offset (ha)	Proposed offset area (ha)	Effective offset ratio
Brigalow	Norwich Park, 70 km south of CRM	Regrowth 628.85	20.6	100.0	1:4.8
Natural grasslands	BHP Coal and Others owned land in proximity to Gregory Crinum coal mine, 124 km south-east of CRM	Remnant 425.44	124.6	350.0	1:2.8
Poplar box	BHP Coal and Others owned land at Blackwater, 170 km south-east of CRM	Total 779.22 includes Major Vegetation Group 771.8	112.8	388.0	1:3.4

In addition to acquiring land to offset the brigalow, natural grasslands and poplar box REs, BMA has also committed to make all reasonable attempts to control the extent of weed species including buffel grass in areas currently supporting brigalow, and parthenium in areas currently supporting native grasslands.



### 5.5.2.1 Coordinator-General’s offset requirements and BMA’s proposes strategy

**I acknowledge** that the actual areas of REs proposed to be cleared for the mine are generally in poor condition, fragmented and have poor ecological value, and that the loss on a regional scale is not significant.

**I am satisfied**, as described in the EIS and SEIS, that some areas of vegetation that require clearing have previous approval, as they were included in the approved surface area for the Peak Downs Mine project before the CRM in the north of the Peak Downs mining lease was defined as a separate mine. Therefore, **I require** that only those areas of REs classified under the VM Act as endangered or of concern that do not have existing approval for clearing shall be the subject of an offsets package to satisfy Queensland state requirement.

**I have determined** that the total areas of REs to be unavoidably cleared and not already approved are:

- poplar box woodlands — 112.8 hectares
- brigalow woodlands — 20.6 hectares
- natural grasslands — 124.6 hectares.

In consideration of all parameters associated with the current size, location, ecological integrity, protection status, local/regional significance and connectivity of REs proposed to be cleared for the CRM, **I recommend** that the following minimum offset ratios apply to the CRM:

- zero offsets for ‘least concern’ REs
- 1:2 offsets for ‘of concern’ REs (VM Act status and/or Biodiversity status)
- 1:3 offsets for ‘endangered’ REs and EECs under the EPBC Act.

In light of current offset policies, **I further consider** that these ratios would need to be increased as the ecological integrity, protection status, contiguity, RE similarity and connectivity of proposed offset decreased and as the distance of the offset from the CRM increased.

On this basis, **I consider** that the minimum offset areas described in Table 6 should apply to the CRM.

**Table 6: Minimum required offset areas for the CRM**

RE	RE Number	EPBC Act status	VM Act status	Biodiversity status	Area requiring offset (ha)	Minimum offset required (ha)
Poplar box	11.3.2	N/A	of concern	of concern	108.3	225.6
	11.4.2	N/A	of concern	of concern	4.5	
Brigalow	11.4.8	Endangered	Endangered	Endangered	8.2	61.8
	11.4.9	Endangered	Endangered	Endangered	12.4	
Natural grasslands	11.8.11	Endangered	of concern	of concern	124.6	373.8
Forest red gum / river red gum	11.3.25	N/A	least concern	<b>of concern</b>	31.5	63.0
Total not EPBC listed					144.3	288.6
Total EPBC listed					145.2	435.6
<b>TOTAL</b>					289.5	724.2

**I consider** that the offset requirements outlined in Table 6, for the clearing of the 31.5 hectares of RE 11.3.25 riverine red gum, which has an ‘of concern’ Biodiversity Status (although ‘least concern’ under the VM Act) may be more flexible than for the other REs.

Although BMA's offset proposals outlined in Table 6 (above) and Appendix 4 are draft and still subject to DERM and DEWHA approval, I observe:

- With respect to the proposed natural grasslands offset at Gregory Crinum:
  - the quality of the grassland there requires further assessment
  - Figure 1 of Appendix 4 appears to indicate that the offset EECs are present in several small separated pockets spread over an area of greater than 10,000 hectares
  - the nature and condition of the land between and around the grassland areas are not specified and BMA's intentions with respect to the management of these areas and the grasslands have not been specified
  - opportunities exist to rehabilitate connectivity between fragmented remnants where practicable
  - the area includes 4.87 hectares of endangered RE 11.3.21 (*Dicanthium* and/or *Astrelba* species grassland REs) and 396.37 hectares comprising mixed REs of which only 80 per cent is the equivalent of the RE 11.8.11 proposed to be cleared for the CRM. That is, 317.1 hectares of RE 11.8.11 is within the mixed REs.
  - discounting the proportions of the proposed offset that are not natural grassland REs (i.e. within the mixed REs), the total area of natural grassland available there is 346 hectares, which may not be sufficient to achieve the minimum required offset area for an EPBC-listed endangered EEC
  - the ownership and tenure arrangements are unclear
  - on the basis of these points, **I consider** the proposed offset is inadequate without further augmentation.
- With respect to the proposed brigalow offset at Norwich Park:
  - the offset relies entirely on regrowth brigalow rather than remnant
  - the proposed offset area, which has not yet been gazetted as a nature refuge, has been designed as an 'offset bank' to acquit vegetation offset obligations of BMA-owned projects. It covers a total of 1091 hectares that contains both remnant and regrowth vegetation, including approximately 350 hectares of brigalow dominated regrowth and approximately 150 hectares of mixed brigalow, Dawson gum and poplar box regrowth
  - the land is owned by CQCA and is managed by BMA, although non-BMA entities hold a coal exploration permit and an authority to prospect for petroleum over the area
  - as the proposed offset ratio is approaching 1:5 and the range of ecological values for this refuge appear to be high, **I consider** this offset proposal to be acceptable.
- With respect to the proposed poplar box offset at Blackwater:
  - the proposed offset area covers a total area of 779.22 hectares
  - 7.43 hectares of the available offset comprises of concern RE 11.3.2
  - 771.79 hectares is a 'major vegetation group' (MVG) comprising mixed REs 11.3.2/11.3.25/11.3.4, with a ratio of 80:15:5, which equates to areas of 617.4, 115.8 and 38.6 hectares respectively
  - the REs there are different from the REs to be cleared at the CRM (although of same poplar box MVG)
  - the 170 kilometre distance from the CRM is a consideration
  - the quality of the woodland there requires further assessment



- on the basis of these points, **I consider** that if BMA is to utilise the Blackwater site for this offset, then an offset ratio of at least 1:4 (i.e. at least 450 hectares, rather than the 1:3 ratio (388 hectares) suggested in Appendix 4) would be more appropriate
- there is enough total poplar box area there to achieve a 1:4 offset ratio.

## Conclusions

**I note** that the natural grassland REs present within the proposed Gregory Crinum offset area also include 4.87 hectares of endangered RE 11.3.21 (Dicanthium and/or Astrebla species grassland REs) and 396.37 hectares comprising mixed REs of which only 80 per cent is the equivalent of the RE 11.8.11 proposed to be cleared for the CRM. That is, 317.1 hectares of RE 11.8.11 is within the mixed REs. However, despite the highly fragmented nature of the offset identified by BMA, and the inclusion of 396.37 hectares of mixed REs comprising 80 percent of RE 11.8.11, **I am satisfied** that the offset proposed by BMA is sufficient to meet the requirements for VM Act-listed of concern REs (minimum 1:2 offset ratio).

However, **I am not satisfied** that the offset of 350.0 hectares for the clearing of 124.6 hectares of natural grassland RE 11.8.11 is sufficient for an EPBC-listed EEC (minimum 1:3 offset ratio). Therefore, **I impose** Condition 3(a)(i), Schedule 1, Appendix 1 requiring BMA to provide a minimum of 373.8 hectares of offset (see also section 6 of this report, Matters of National Environmental Significance).

**I note** that the area at Blackwater proposed to offset the clearing of poplar box woodland is not the same RE as that proposed to be cleared for the CRM but is of the same 'major vegetation group' of eucalyptus woodland of equivalent conservation status in the Brigalow Belt Bioregion. However, given that both the VM Act and Biodiversity status of this RE is of concern, **I am satisfied** that the offset identified by BMA is sufficient to offset the loss of poplar box woodland on the CRM site.

**I note** that there is 31.5 hectares of forest red gum/river red gum RE 11.3.25 present on the CRM site, which is a riparian/riverine eucalyptus woodland that has a VM Act status of 'least concern' but, due to its habitat and connectivity values, has a higher Biodiversity status of 'of concern'. **I impose** Condition 3(a)(vii), Schedule 1, Appendix 1 requiring the proponent to provide an offset for RE 11.3.25, to a ratio of not less than 1:2, (i.e. an area of not less than 63.0 hectares).

**I note** that the poplar box REs present within the proposed Blackwater offset area also include 771.79 hectares of a 'major vegetation group' (MVG) comprising three REs 11.3.2/11.3.25/11.3.4, with a ratio of 80:15:5, which equates to areas of 617.4, 115.8 and 38.6 hectares respectively. Therefore, **I am satisfied** that the area of 115.8 hectares of RE 11.3.25 on the Blackwater property is sufficient to offset the loss of 31.5 hectares of forest red gum/river red gum on the CRM site.

**I acknowledge** the commitment by BMA to undertake additional and ongoing management activity to mitigate impacts to native vegetation communities. To confirm these commitments **I have imposed** Conditions 3(b)-(d) that require BMA to provide DEWHA and DERM a 'Threatened Flora and Fauna Species and Threatened Ecological Communities Management Plan' that:

- ensures the impacts to these species and communities are minimised
- contributes to the survival of these species in the wild, and
- achieves conservation benefits for these species and communities where practicable.

**I note** that DEWHA may also seek to review the further development of these commitments.

**I acknowledge** the commitment by BMA to prepare and implement a Biodiversity Offset Strategy (Appendix 4 of this report), in consultation with relevant agencies, to address the requirements of state and Commonwealth legislation and policies for offsets. While Condition 3(a), Schedule 1, Appendix 1 requires the final approval of the Biodiversity Offset Strategy by DERM and DEWHA, **I recommend** (Recommendation 5, Schedule 5, Appendix 1) with respect to the proposals in Appendix 4 that:

- the general scope of the offset proposal for brigalow at Norwich Park is acceptable
- subject to verification of sufficient integrity of the proposed offset vegetation, the general scope of the offset proposal for poplar box vegetation at Blackwater is acceptable
- subject to the provision of more detailed information, the offset proposal for natural grasslands at Gregory Crinum appears to be insufficient for EPBC-listed ECCs without further augmentation
- to avoid the risk of double-counting, BMA delineates and quantifies in the Biodiversity Offset Strategy the areas of vegetation in each proposed offset area attributable to each phase of the BBCG project
- DEWHA and DERM decision makers on the Biodiversity Offset Strategy for the CRM note my comments in section 5.5.2.2 (below) of this report in relation to BMA's offset proposals.

DERM has been consulted and is generally supportive of my conclusions on the Biodiversity Offset Strategy presented by BMA.

### 5.5.2.2 Uncertainty about other resource tenures over offset areas

There is potential for the tenure of the proposed offset lands to be subject to future applications for development under the *Mineral Resources Act 1989* and the *Petroleum and Gas (Production and Safety) Act 2004*, hence affecting their protection status for vegetation offsets.

A vegetation offset would normally be expected to have protection from development in a way that would see the area managed sustainably for an indefinite period. It is desirable that a conservation agreement for a nature refuge be obtained over the offset lands, as this would provide some protection from development other than mining or petroleum development. However, due to the prior existence of resource tenures over the land, NRAs cannot be relied upon to deliver absolute security for the proposed offset lands.

**I note** that it may be some years before the fate of the proposed CRM offset lands become known, so **I do not require** the proponent to secure alternative lands at this time. Instead, **I require** the proponent to find a satisfactory alternative if any of a future secured CRM offset area is cleared, or should BMA relinquish management of the offset. The alternative could be either the provision of another offset area, or an equitable monetary contribution to Ecofund Queensland's Trust or other offset broker that could be used to purchase land to be added to the protected estate. Payments for any on-going management costs for an alternative offset would also have to be made until the offset attained its remnant status.

**I also** note that should the CRM offset lands be proposed to be cleared in the future by the holder of the underlying mining or petroleum tenures, then those tenure holders would also be required to provide additional offsets for that particular clearing.

### 5.5.3 Terrestrial fauna

#### EIS findings, submissions and analysis

A total of 153 terrestrial vertebrate species was recorded as being located on the CRM site or nearby, including 20 species of mammal, 113 birds, 10 reptiles and 10 amphibians (EIS, Table 8.7).

Twenty of the fauna species are recognised as species of special conservation significance under the EPBC Act and/or NC Act: of these, six are EPBC-listed threatened (vulnerable) fauna species (see section 7.3.3). Nine of the listed fauna species were not recorded on the CRM site but may occur, based on records from the local area and the presence of suitable habitat within the CRM site.

Of note, the relatively intact poplar box (*Eucalyptus populnea*) open woodland habitat (REs 11.3.2 and 11.5.3) south of Cherwell Creek may support a population of koalas



(*Phascolarctos cinereus*), though this area is not directly impacted by the mine construction and operation.

The EIS (section 8.2, and Appendix K section 4.3) describes the extent of suitable habitat for the EPBC-listed fauna species.

The EIS reported that 19 EPBC-listed migratory bird species were identified to potentially use the study area. All of the species are relatively common and widespread across the regional landscape. As mentioned in section 7.3.3 of this report, the presence of migratory species is not an EPBC Act controlling provision for the CRM.

The EIS concludes that there is little evidence to suggest that the CRM area supports 'important habitat' for migratory bird species, whether they are wetland or terrestrial species, nor that the CRM area supports an 'ecologically significant proportion of a population' of any of the migratory birds known or considered likely to occur.

The potential impacts to terrestrial fauna from the CRM may occur due to clearing and fragmentation of vegetation and habitat, light pollution, entrapment of fauna in trenches or excavations, vehicle collisions, increased competition and predation from exotic species.

The EM plan describes the mitigation and compensatory measures to be implemented to reduce the impacts on fauna, including EPBC and NC Act listed species, migratory species and koalas. These include minimising clearing and implementing a 'permit to clear' system, implementing dust suppression, strategic rehabilitation of disturbed areas, fauna spotters/catchers present during clearing operations within high value habitat, retention of important habitat features such as large hollow-bearing trees, pest control measures, speed limits to reduce mortality of fauna on roads and appropriate procedures for caring for injured animals. The EM plan identifies that a fauna monitoring program will be implemented during the construction and operational phases of the mine.

In the EIS (section 8.1.2.3) and SEIS (Appendix A3), BMA has committed to pre-clearing fauna surveys to mitigate potential impacts to conservation significant species. This is included in the CRM EM plan.

In its submission on the EIS, DERM recommended that the requirements of the NC Act should be addressed, and that the EIS should significantly expand the survey effort, scope and detail of practical measures required to avoid or mitigate the impacts of construction and operation on flora and fauna.

In Appendix A3 of the SEIS, BMA responded to the DERM submission noting that the fauna (and flora) surveys conducted for the EIS fulfilled the terms of reference and were conducted consistently with currently accepted standards; and that consideration of potential impacts to flora and fauna, including koalas had been addressed. Further advice from DERM was that 'Back on Track' species listings and an associated 'Recovery Actions Database' were still under development as a framework for DERM to prioritise conservation tasks for significant species.

## Conclusions

Based upon the information presented in the EIS and SEIS, **I am satisfied** that the fauna and flora surveys conducted for the EIS fulfilled the terms of reference and were conducted consistently with currently accepted standards. Furthermore, **I am satisfied** that the EIS, SEIS and EM plan adequately address potential impacts to native fauna, including koalas, EPBC-listed significant species and migratory species.

**I acknowledge** advice from DERM that 'Back on Track' species listings and an associated 'Recovery Actions Database' are under development as a framework for DERM to prioritise conservation tasks for significant species. **I consider** that, when finalised and implemented, this framework will become an essential tool for the conservation of native flora and fauna in Queensland. **I impose** Conditions 3(b)-d) in Schedule 1, Appendix 1 requiring the preparation of a 'Threatened Flora and Fauna Species and Ecological Communities Management Plan' to the satisfaction of DERM and DEEWA, which must include:

- affected species listed by DERM on its 'Back on Track' systems that are identified as in decline and have a good potential for recovery



- a commitment to provide information on flora and fauna management actions for significant species for inclusion in DERMs 'Recovery Actions Database' when that framework is finalised and becomes operational.

**I am satisfied** that the proposed mitigation measures and fauna monitoring will reduce the impacts on fauna as a result of construction and operation activities. Nonetheless, **I impose** Condition 3(c), Schedule 1, Appendix 1 which requires that the 'Threatened Flora and Fauna Species and Ecological Communities Management Plan' includes:

- BMA's commitments on these matters
- affected species listed as endangered, vulnerable or rare under the *Nature Conservation Act 1994*
- a description of how BMA will satisfy the requirements of section 322 of the *Nature Conservation (Wildlife Management) Regulation 2006* relating to tampering with animal breeding places, and
- management measures addressing the threatened species listed in the 'controlling provisions' for the CRM under the EPBC Act.

In addition, in consultation with DERM, **I state** Condition H1, Schedule 3, Appendix 1, which requires a qualified spotter/catcher to work ahead of the site clearing works at the commencement of the vegetation clearing activity.

## 5.5.4 Aquatic ecology

### EIS findings, submissions and analysis

Aquatic habitats within the CRM area consist of natural streams and drainage lines including Cherwell Creek, Caval Creek, Horse Creek, Nine Mile Creek, the dammed channel of Harrow Creek, and mine and farm dams. These waterways are predominately ephemeral and are tributaries of the Isaac River and part of the Fitzroy River basin. The dams usually contain water year round. Ground survey for the EIS found the natural drainage lines to be predominately dry, highly disturbed and devoid of aquatic vegetation.

Sampling of macroinvertebrates and assessment of stream health was not undertaken for the CRM EIS. Instead, information was inferred from surveys and assessment undertaken for the Daunia Mine, 40 kilometres east of CRM.

Previous surveys and ground survey for the EIS indicate that at least six native fish species are present within the local aquatic habitat. None of the species are listed under the NC Act or EPBC Act and all are considered common in the Fitzroy River basin. No exotic species were recorded. Three fish species were collected during field survey for the EIS:

- western carp gudgeon (*Hypseleotris klunzingeri*)
- spangled perch (*Leiopotherapon unicolour*)
- eastern rainbowfish (*Melanotaenia splendida*).

The creeks would potentially attract a number of frog species when in flow, but no frog species were recorded for the CRM site. Only one water-dependent reptile, Macquarie turtle (*Emydura macquarii*), has been recorded on the CRM site or surrounds.

A section of Horse Creek and a section of Caval Creek are proposed to be diverted as they traverse areas to be incorporated into Horse pit and part of the industrial area. The proposed route for transporting the dragline between Horse and Heyford pits would require the crossing of the main channels of Caval and Cherwell Creeks. Minimal disturbance to Nine Mile Creek and Harrow Creek would occur at creek crossings for the conveyor system, haul road and rail corridor.

These diversions and waterway crossings would have the potential to impact on downstream aquatic ecology through alterations to environmental flows. BMA proposed in its CRM EIS that any diversions and watercourse crossings would be undertaken during dry conditions to minimise impacts on aquatic ecology. Diversion of watercourses and interference with flows



would require approval from DERM under the *Water Act 2000* (see section 4 of this report, Approvals). Works within the bed of a creek or gully may require approval for waterway barrier works from DEEDI (QPIF) under the *Fisheries Act 1994* (see section 4 of this report, Approvals).

Other indirect impacts to environmental flow and water quality could result from sedimentation, chemical spills, and the introduction and spread of weeds.

Reduced water quality may also result from mine run-off (e.g. from processing plants or stockpiles). However, most of the aquatic species within the vicinity of the CRM site are wide ranging and capable of withstanding a broad range of aquatic conditions.

Mitigation of potential impacts from the CRM are outlined in chapter 8 of the EIS and include maintenance of buffer zones around riparian areas and streams outside the disturbance zone, erosion and sedimentation controls, monitoring of runoff, vegetative stabilisation of soil in all non-operational areas, active rehabilitation of streams and riparian zones.

To address disturbance of watercourses, BMA has committed in the EIS to develop a revegetation plan for creek diversions and undertake ecological monitoring of aquatic ecology.

Additional discussion relevant to aquatic ecology is provided in section 5.3, Surface water resources, and section 5.4, Groundwater resources.

## Conclusions

**I consider** that the potential direct impacts to aquatic species and habitats on the CRM site are not significant and that proposed mitigation measures, in combination with rehabilitation of the disturbed areas and surface water controls described in sections 5.3 and 5.4 of this report, are sufficient to minimise and mitigate any potential impacts on aquatic species and habitats on the CRM site and downstream.

However, to ensure that any disturbance of watercourses and aquatic ecology is minimised, in consultation with DERM, **I state** Conditions H2 and H3, Schedule 3, Appendix 1 that require BMA to develop and implement a 'Watercourse Revegetation Plan' before any diversion works commence which includes:

- the establishment of benchmarks for vegetation condition in watercourses and riparian areas
- a description of how and when the revegetation objectives will be achieved
- an aquatic ecology monitoring program to ensure that the aquatic ecology values are maintained or enhanced
- a description of performance monitoring and reporting arrangements, and
- contingency actions should stated performance objectives not be achieved.

### 5.5.5 Pest plants and animals

#### EIS findings, submissions and analysis

Five pest plant species listed as declared plants under the *Land Protection (Pest and Stock Route Management) Act 2002* were recorded from the CRM site, as follows:

- mother of millions (*Bryophyllum delagoense*) — Class 2
- harrisia cactus (*Eriocereus martinii*) — Class 2
- velvet tree-pear (*Opuntia tomentosa*) — Class 2
- parthenium weed (*Parthenium hysterophorus*) — Class 2
- lantana (*Lantana camara*) — Class 3.

Of these species, harrisia cactus, mother of millions and velvet tree-pear were distributed throughout the entire site, particularly within non-remnant grasslands and RE 11.5.3, while

parthenium was generally restricted to areas overlying basalt—RE 11.8.11 (EPBC-listed EEC natural grasslands) and RE 11.8.5. Infestation of parthenium within these areas was very high, resulting in suppression of native species, particularly grasses. The areas of brigalow on the CRM site were infested by buffel grass (*Cenchrus ciliaris*).

The EM plan includes impact mitigation objectives and strategies to manage existing infestations of pest plants and prevent new introductions.

Desktop and field surveys for the EIS identified ten species of pest animals on the CRM site, none of which are unexpected and all are commonly found in central Queensland.

They are:

- cat (*Felis catus*) — Class 2
- rabbit (*Oryctolagus cuniculus*) — Class 2
- pig (*Sus scrofa*) — Class 2
- cane toad (*Bufo marinus*)
- house sparrow (*Passer domesticus*)
- house mouse (*Mus musculus*)
- black rat (*Rattus rattus*)
- brown hare (*Lepus capensis*)
- donkey (*Equus asinus*)
- goat (*Capra hircus*).

The EM plan includes detailed measures for the management of pest animals during the construction and operational stage of the mine.

**I am satisfied** that the measures proposed in the EIS, the commitments made by BMA, and the proposed EA conditions specified in Schedule 3, Appendix 1 for pest plants and animals to be incorporated into the EM plan are sufficient to mitigate and manage any potential adverse impacts associated with pest plants and animals associated with the CRM.



## 5.6 Air quality

### 5.6.1 Context

Existing sources of dust in the local air environment include several operating coal mines, coal seam gas projects, a quarry and agricultural activities such as cropping and grazing.

Air emissions relevant to the CRM are primarily particulate matter such as dust. For the CRM, investigations were undertaken and reported in the EIS in the following categories:

- total suspended particles (TSP), of interest for amenity
- deposited dust, of interest for amenity and nuisance
- particulate matter less than ten micrometres ( $\mu\text{m}$ ) in diameter ( $\text{PM}_{10}$ ), of interest for human health
- particulate matter less than 2.5  $\mu\text{m}$  in diameter ( $\text{PM}_{2.5}$ ), of interest for human health.

The impacts on the air environment are assessed against standards and goals, such as those contained in the Queensland *Environmental Protection (Air) Policy 2008* (EPP (Air)). The purpose of the EPP (Air) is to achieve the object of the *Environmental Protection Act 1994* in relation to the air environment: that is, to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (ecologically sustainable development).

The environmental values to be enhanced or protected under the EPP (Air) are the qualities of the air environment that are conducive to:

- protecting the health and biodiversity of ecosystems
- human health and wellbeing
- protecting the aesthetics of the environment, including the appearance of buildings, structures and other property
- protecting agricultural use of the environment.

Approximately one third of all submissions on the EIS raised concerns about air quality. Of these, 91 per cent of respondents were concerned with health issues and nuisance or amenity issues relating to dust. **I consider** that community concern about dust, together with additional community concern about noise and vibration, traffic, accommodation and a range of social impacts of the CRM and the broader BBCG project, justifies that BMA develop a robust community liaison, communications and complaints response system for this mine and the whole BBCG project. I expand on this matter in the Conclusion section below.

In addition, DERM, DTMR, DIP, Queensland Health and Isaac Regional Council (IRC) also provided comments regarding the potential generation of dust from the CRM. Queensland Health was of the view that to prevent background creep in the Moranbah air-shed, the cumulative effects from all industries in the region need to be considered and the 24 hour average and annual average of  $\text{PM}_{10}$  need to be maintained below those recommended by EPP (Air).

### 5.6.2 Methodology used in EIS

#### EIS findings, submissions and analysis

The EIS (section 10.1.1) reported background levels of dust estimated from monitoring data for  $\text{PM}_{10}$  and dust deposition at the CRM site. The estimated background dust levels were:

- 24 hour average ground-level concentration of  $\text{PM}_{10}$  – 18.8 micrograms per cubic metre ( $\mu\text{g}/\text{m}^3$ )

- 24 hour average ground-level concentration of PM<sub>2.5</sub> – 2.9 µg/m<sup>3</sup>
- annual average ground-level concentration of PM<sub>2.5</sub> – 1.6 µg/m<sup>3</sup>
- annual average ground-level concentration of TSP – 26.2 µg/m<sup>3</sup>
- monthly dust deposition – 1.5 g/m<sup>2</sup>/month.

Using the air quality objectives in the EPP (Air) and the DERM adopted guideline for dust deposition, the project goals for dust or particulate matter were presented in section 10.1.2 of the EIS and Appendix B of the SEIS. The project goals are reproduced in Table 7 of this report.

**Table 7: Project goals for air particulate matter for the CRM**

Pollutant	Averaging period	Objective or goal	Jurisdiction
TSP	Annual	90 µg/m <sup>3</sup>	EPP (Air)
PM <sub>10</sub>	24 hour	50 µg/m <sup>3</sup> (5 annual exceedences allowed)	EPP (Air), NEPM <sup>a</sup>
PM <sub>2.5</sub>	24 hour	25 µg/m <sup>3</sup>	EPP (Air), NEPM
	Annual	8 µg/m <sup>3</sup>	EPP (Air), NEPM
Dust deposition	Monthly	4 g/m <sup>2</sup> /month	DERM

a – NEPM is National Environment Protection Measures made under the *National Environment Protection Council Act 1994* (Cwth).

Predicted impacts from construction and operation of the CRM on local air quality were assessed in the EIS using dispersion modelling. Impacts from mining activities were evaluated at the following three stages:

- Year 1 – mining in Heyford Pit and construction of initial box cut for Horse Pit
- Year 2 – mining in both Heyford Pit and Horse Pit on the western side of ML1775
- Year 20 – mining in both Heyford Pit and Horse Pit towards the east of the ML1775 where a greater volume of spoil needs to be removed to access the coal.

Figure 10.3 of the EIS shows the assumed location of dust sources used for the air quality modelling described in the EIS.

For each of the mine stages mentioned above, typical operations (based on average annual dust emissions for expected activities at each location), worse case emissions (pit activities occurring in the north or south of each pit) and upset emissions (based on inadequate dust control on haul roads) were modelled.

Meteorological measurements at the Bureau of Meteorology station in Moranbah were insufficient for modelling purposes. Therefore, the meteorological model TAPM<sup>17</sup> was used to generate the data required.

Dust emissions, during each of the three mine stages, were estimated in the EIS based on production data, emission factors, comparison to similar operations and proposed control measures (refer to EIS Tables 10.5, 10.7 and 10.9).

Dispersion modelling using the Calmet/Calpuff modelling package was completed to predict the ground-level concentrations of TSP, PM<sub>10</sub> and deposition of dust over the relevant averaging times in Table 7. The estimated background levels were then added to the modelled emissions from the CRM to provide an assessment of the impact of the CRM on the existing local air environment. Assumptions made in the modelling were detailed in Appendix L of the EIS.

### 5.6.3 Results reported in EIS

In all mine stage scenarios (i.e. year 1, year 2 and year 20), the modelling results for 24 hour average PM<sub>10</sub> concentrations showed exceedences of the EPP (Air) objective of 50 µg/m<sup>3</sup> at

<sup>17</sup> TAPM – *The Air Pollution Model, version 4, CSIRO (2008).*



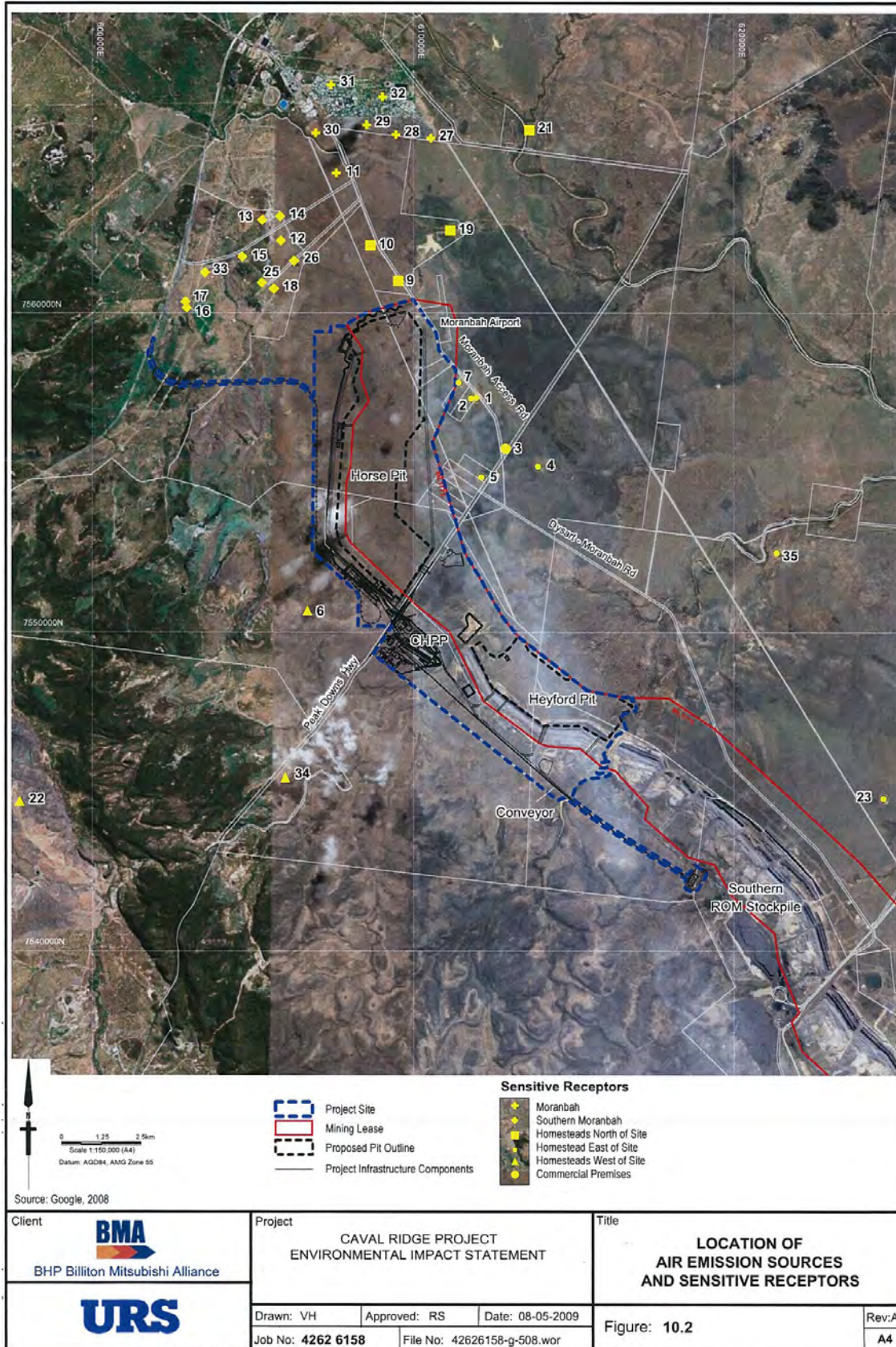
some sensitive receptors. The predicted ground level concentrations above the EPP (Air) objective ranged from a total of 53.5 to 109  $\mu\text{g}/\text{m}^3$ . The lowest exceedence was a total of 53.5  $\mu\text{g}/\text{m}^3$  (i.e. 3.5  $\mu\text{g}/\text{m}^3$  above the EPP (Air objective of 50  $\mu\text{g}/\text{m}^3$ ) for typical operations in Year 1 at receptors identified as 'Homesteads East of site' (EIS, Table 10.11). The highest exceedence was a total of 109  $\mu\text{g}/\text{m}^3$  for typical operations in Year 20 at receptors identified as 'homesteads west of site' (EIS, Table 10.13).

In contrast, the modelling showed predicted air quality impacts to be below the EPP (Air) objectives for TSP,  $\text{PM}_{2.5}$  and dust deposition at all sensitive receptors (shown in Figure 5 below) for the three mine stage scenarios under typical CRM operations.

High dust levels were predicted by the modelling under the worst-case short-term operating conditions. Under worst case conditions,  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  levels were predicted to exceed the air quality objectives at a number of sensitive receptors. BMA acknowledged that modelling the worst-case meteorological conditions highlighted the dependence of the model results on the model default value of the mixing height (EIS section 10.3). The mixing height parameter plays a key role in the calculation of night time impacts which may have contributed to exceedences.

High dust levels were also predicted for the upset conditions, that is, during failure of dust suppression on haul roads. The predicted  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  levels exceeded the air quality goals. This highlights the need for BMA to ensure adequate dust suppression is maintained at all times.

Figure 5: Sensitive receptors for air quality analysis for the CRM (EIS Figure 10.2)





## 5.6.4 Project improvements, refinement of assumptions and modelling undertaken for SEIS

After the EIS public comment period, BMA undertook a review of the methodology used in the air quality assessment and suggested that overly conservative assumptions had been applied to the model used in the EIS which had led to excessive predictions of air quality impacts of dust. Changes to proposed operations to reduce dust that were incorporated into the revised modelling presented in the SEIS compared to the EIS included:

- reduction of vehicle traffic and therefore reduction in the amount of dust created (operations amended so that coal haul trucks backload with rejects)
- an additional pit ramp at Horse Pit so that the trucks stay below the surface for longer, reducing the amount of dust which is released above ground
- dewatered tailings disposed in both pits rather than only at the northern part of the site.

BMA also made a commitment to reduce the equipment fleet, particularly dozers.

Changes to modelling methodology and assumptions that were incorporated in order to reduce the level of conservatism within the model include<sup>18</sup>:

- use of a representative dragline drop height and dozer utilisation
- more accurate representation of coal moisture content with EIS value of eight per cent for all coal replaced with four per cent for ROM coal and nine per cent for product coal
- use of updated wind speed and wind direction data from on-site monitoring collected during 2008
- constant emission rates associated with stockpiling and exposed area replaced with wind speed dependent emission rates for dust sources.

The results reported in the SEIS showed that the annual average ground-level concentration of PM<sub>2.5</sub> is not predicted to exceed the EPP (Air) objective of 8 µg/m<sup>3</sup> at any receptor location under typical operations. Similarly, ground-level concentrations of TSP and dust deposition are not predicted to exceed the relevant project goals at any of the receptor locations included in the dispersion modelling (SEIS Appendix B section 4.3). The summary of results for 24 hour average PM<sub>10</sub> concentrations provided in Appendix B of SEIS indicate that they are less than the project goal of 50 µg/m<sup>3</sup> at receptor locations in the township of Moranbah. However **I note** that for the mining scenario in year one, the PM<sub>10</sub> objective is predicted to be exceeded at 11 receptor locations, in year two at eight receptor locations and in year 20 at 16 receptor locations. All of these receptor locations are outside of the township of Moranbah and closer to the CRM site.

## 5.6.5 Proposed management of air quality impacts

**I note** that the EPP (Air) provides advice on an appropriate hierarchy to manage impacts. For CRM, this should involve:

- avoiding dust generation
- minimising dust generation
- managing dust generation.

In the SEIS, BMA proposed the following dust mitigation options to reduce impacts of dust on the local air environment:

- engineering controls such as enclosing transfer points, roof on conveyors, belt washing/scrapers, reduced drop height for coal and spoil and enclosing raw coal surge bins

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<sup>18</sup> URS, Caval Ridge Air Quality Assessment – Supplementary Report, 30 October 2009



- additional dust suppression measures such as more water sprays on stockpiles and haul roads, and use of chemical reagent sprayed on the surface of each loaded train wagon
- rehabilitation of exposed and disturbed surfaces
- implementation of operational procedures such as consideration of recent rainfall and weather conditions and restrictions on some activities during adverse conditions
- measurement of ambient air quality.

During the preparation of this Coordinator-General's report, BMA clarified that in addition to those measures, it would also undertake mine planning and design to reduce dust, and implement extensive training of mine site personnel in dust awareness and management.

**I note** that the following air quality control operational procedures proposed in the EIS (section 10.2.13.4) to be incorporated into site operational procedures have not all been included or have been significantly modified in the draft EM plan (SEIS, Appendix O, section 3.3.6):

- reduction or cessation of haul truck movements in the event of failure of dust control measures in conjunction with data on ambient impacts and weather conditions
- restrictions on pre-strip and overburden dumping in the north of Horse Pit during adverse weather conditions as assessed by visual inspection combined with on-site meteorological monitoring data
- restrictions on the co-location of pre-strip, overburden dumping, coal excavation and draglines in the north of Horse Pit during adverse weather conditions as assessed by visual inspection combined with onsite meteorological monitoring data.

Advice provided by BMA in May 2010 was that these measures were removed or modified in the draft EM plan presented in the SEIS to provide for increased operational flexibility whilst continuing 'BMA's commitment to dust management'. The reinstatement of these or similar measures into the EM plan as part of the overall air quality management strategy for the CRM, and to achieve compliance with the air conditions of the EA is taken into account in the discussion below.

Queensland Health and DERM have worked cooperatively with DIP to develop a set of recommended air emission conditions for the CRM which manage potential impacts on human health in Moranbah due to particulate emissions from the CRM that are consistent with the EPP (Air).

The approach to air particulate management proposed in the EA conditions (Schedule 3, Appendix 1) provides two alternative sets of conditions for air emissions. Option 1 applies to DERM's standard air emission conditions which enforce a strict regulatory limit for the EPP (Air) objectives with associated monitoring and reporting to ensure compliance. Option 2 which also meets the EPP (Air) objectives, does not set a strict regulatory limit, but it includes more extensive response, monitoring and reporting requirements. The basis of Option 2 is that, while air particulate limits are not strictly set, the proponent must develop and implement an air particulate monitoring and control program which includes:

- the collection of air quality and meteorological data
- a forecasting system to identify adverse meteorological conditions likely to produce elevated levels of PM<sub>10</sub> and
- a dust control strategy that would activate the timely implementation of 'high management particulate control actions' during the adverse meteorological conditions identified by the forecasting system.

To be clear about option 2, although the objective of meeting the EPP (Air) PM<sub>10</sub> level of 50 µg/m<sup>3</sup> would remain, a failure to achieve that level alone would not constitute a non-compliance with the EA. Instead, compliance with option 2 would be measured against the proponent's response in implementation of the 'high management control actions' (Table B2, Schedule 3, Appendix 1) in circumstances where the 50 µg/m<sup>3</sup> level cannot be met.



It is understood that an objective of BMA's air particulate monitoring and control program would be to minimise the potential impact of dust generated by CRM operations at sensitive areas. Therefore, a hierarchy of controls would provide for both a proactive approach to dust management under all weather conditions, as well as special responses in the event of predicted weather conditions that may lead to elevated dust levels.

**I consider** that, should BMA decide to accept the alternative ('option 2') approach, then a review, conducted in consultation with all relevant government agencies, would be required after a 24 month period of operation of the CRM. Such a review should aim to determine whether the approach is effectively managing the potential impacts on human health due to particulate emissions on the residents of Moranbah, and that the proponent is achieving best practice particulate emissions management controls for the CRM. The collection and review of any associated health data would need to be done in collaboration with Queensland Health.

Any review of the alternative air conditions conducted for the CRM should be done in consideration of the outcomes of any similar reviews being conducted or concluded for other coal mines in Queensland.

### 5.6.6 Proposed ambient air quality monitoring program

As part of its air quality management strategy, BMA proposed to implement an ambient air monitoring program to measure the impact of dust emissions at sensitive receptors. Based on advice received by DIP in May 2010 (Appendix 5), BMA will monitor ambient air quality at 16 locations in the vicinity of the CRM (see Figure 6 below). BMA proposed to use the data obtained from the ambient air monitoring program, which would then allow BMA to develop targeted and effective mitigation measures that can be incorporated into operational procedures for the management of dust impacts.

BMA has redesigned the air quality monitoring program for the CRM to include the following components:

- six continuous dust monitoring sites measuring TSP, PM<sub>10</sub> and PM<sub>2.5</sub> using tapered element oscillating microbalances (TEOM) units to be located at the Moranbah airport (site 8 in Figure 6), corner of Moranbah Railway Road and Moranbah Access Road (site 2), end of Moranbah Railway Road (site 5), two sites on the south-western side of the CRM site (sites 12 and 16) and one site on the south-eastern side of the CRM site (site 13)
- three high volume samplers to be analysed for particle size distribution and composition
- 15 dust deposition gauge sites
- seven meteorological monitoring sites to enable accurate interpretation of TEOM results.

The focus of the operational monitoring program is the meteorological station located near the CHPP (site 14), the dust deposition gauges at all locations, and the continuous dust monitoring network sites.

The operational monitoring program will involve three stages of actions as described in section 3.3.8 of the draft EM plan (SEIS, Appendix O).

**I commend** BMA's commitment to this comprehensive program of air quality monitoring which should provide sufficient quality data at the required sites to support the CRM air quality management program. While **I consider** that the monitoring type and locations outlined by BMA in Appendix 5 of this report appear to be broadly acceptable, the other elements of Appendix 5 are not necessarily accepted, especially where these may be inconsistent with the Schedule 3 draft EA conditions.

### 5.6.7 Proposed Moranbah township air quality monitoring program

In March 2010, BMA publicly announced that in addition to the CRM ambient air quality monitoring program proposed in the EIS, it would independently initiate an air monitoring program at a location in Moranbah to assist with the understanding of air conditions in the town. While BMA proposes that the information collected from this monitoring station will be analysed and evaluated with monitoring data from its CRM operations, the Moranbah town monitoring station would not form part of the formal CRM monitoring requirements of the EA or the EM plan for the CRM.

The BMA Moranbah Town Monitoring Station will include a continuous monitoring station, which will record TSP, PM<sub>2.5</sub>, PM<sub>10</sub> and meteorological data. At the time of finalisation of this report, the monitoring equipment had been purchased and delivered. A development application is currently being lodged with the IRC for the use of a property owned by BMA on the eastern side of town for air monitoring purposes. The site complies with AS/NZS 3580.1.1:2007 *Guide to siting air monitoring equipment*.

A contractor has been commissioned to install equipment as soon as the development application is approved. The equipment will be maintained by BMA.

For the Moranbah town monitoring station, BMA proposes that an independent third party will:

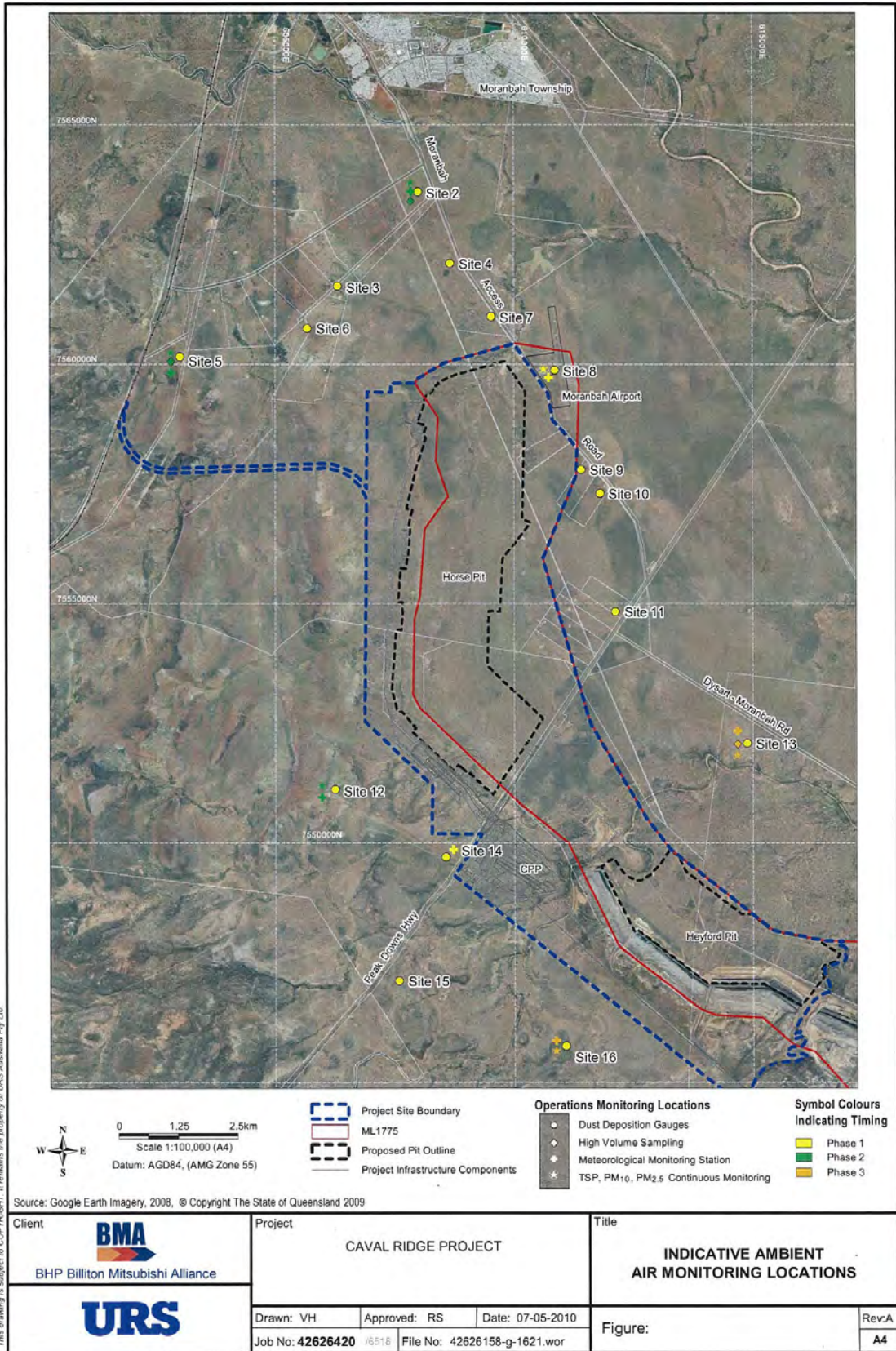
- collect, process, review and quality assure all data
- prepare a summary report of the results
- make the summary report available to the public on a periodic basis.

**I commend** BMA for responding to numerous requests from the IRC and the Moranbah community by establishing an air quality monitoring station in the town and funding the long term maintenance, calibration, data collection and reporting of results from the Moranbah Town Monitoring Station. However, **I consider** that, over time, a program of Moranbah town air quality monitoring should, in consultation with the IRC and the Moranbah BMA Community Network (refer to Condition 6, Schedule 1, Appendix 1), be developed to:

- include the other key local mine project participants near the town, especially the operations of Vale (owner of the Isaac Plains Mine), Anglo American Metallurgical Coal (owner of the proposed Moranbah North and Grosvenor coal mines) and Quarrico (operator of the local Grosvenor Quarry) in the funding and management of the program
- establish a voluntary communication network between the IRC and environmental officers on mine sites located within an approximately ten kilometre radius of Moranbah to share information in confidence about meteorological and air quality conditions in the town and at the respective mine sites aimed at jointly improving air quality management knowledge and practices in the area
- initially report air quality results monthly, but following an appropriate period of calibration and verification, progress to more frequent reporting of results on a publicly accessible webpage than the approximate quarterly reporting currently proposed by BMA.



Figure 6: Indicative ambient air quality monitoring sites for the CRM



## Conclusion

While the circumstances of each mining project are different, it is important to ensure a consistent application of the EPP (Air) to the resources industry in Queensland. On this matter, **I note** that section 8(4) of the EPP (Air) states that:

*"It is intended that the air quality objectives be progressively achieved as part of achieving the purpose of this policy over the long term".*

Therefore, **I consider** that the EPP (Air) objective for 24 hour average concentration of PM<sub>10</sub> of 50 µg/m<sup>3</sup> and five allowable exceedences per annum should be a key element of air quality management applied to the CRM, with the aim of achieving this level in the long term.

**I am satisfied** that the air quality management hierarchy within the EPP (Air) is met by the dust mitigation measures proposed by BMA for CRM. That is, the proposed engineering controls will assist in reducing the generation of dust, the dust suppression measures and rehabilitation of exposed surfaces will assist in minimising dust generation, and the proposed operational procedures and monitoring will assist in managing dust generation.

However, regardless of the refinement by BMA of the air quality model, **I find** that it is likely that the 50 µg/m<sup>3</sup> objective with respect to the 24 hour average for PM<sub>10</sub> will be exceeded more than five times a year at sensitive receptors between the proposed CRM and the town of Moranbah. Therefore, in order to reduce the risk of air quality impacts on sensitive receptors, in consultation with DERM, **I state** that for the EA for the CRM either:

- 'Option 1', Conditions B1-B7, Schedule 3, Appendix 1 ('standard EA conditions') apply, or
- 'Option 2', Conditions B1-B11, Schedule 3, Appendix 1 ('high management control measures') apply.

With respect to 'Option 2', **I also impose** Conditions 16(a)-(f), Schedule 1, Appendix 1 that require the proponent to conduct a review after a 24 months operation of the CRM in consultation with DERM, Queensland Health, the IRC, Mines and Energy in DEEDI and the Coordinator-General. Such a review should aim to determine whether the approach is effectively managing particulate emissions in the town of Moranbah with respect to the 50 µg/m<sup>3</sup> objective, and that the proponent is continuously improving particulate emissions management for the CRM. The terms of reference for the review must be approved by DERM and Queensland Health. The future use of 'Option 2' after that review will be determined by the Coordinator-General in consultation with DERM and Queensland Health.

While **I am satisfied** that BMA's proposed monitoring program will provide sufficient information in the initial phase of development, **I require** the proponent to continue consultation with DERM to develop a satisfactory air particulate matter monitoring and control program as required by the draft EA conditions. **I expect** sufficient meteorological monitoring to be carried out by BMA with the objective of developing predictive weather triggers for implementation of the high management control measures if 'Option 2' applies.

**I acknowledge and commend** BMA's voluntary initiative of instigating the monitoring of air quality in the town of Moranbah (separate from the CRM air quality monitoring program) and the collection and use of any data to enhance the understanding of air quality matters around Moranbah. However, **I consider** that a reasonable reporting period for the town air quality monitoring should be set. Therefore, **I recommend** (Recommendation 6(a), Schedule 5, Appendix 1 that requires the proponent to publicly report Moranbah town air quality information on a monthly basis.

**I also recommend** (Recommendation 6(b), Schedule 5) that BMA work with the Moranbah Cumulative Impact Group, ERM and other resource companies with quarries or mines in the vicinity of Moranbah with the objective of creating an integrated air quality monitoring system in the town of Moranbah which:

- establish a voluntary communication network between the IRC and environmental officers on mine sites to share information in confidence about meteorological and air quality conditions in the town and at the respective mine sites aimed at jointly improving air quality management knowledge and practices in the area



- following an appropriate period of data and equipment calibration and verification, progress to more frequent reporting of results on a publicly accessible webpage than the approximate quarterly reporting currently proposed by BMA.

**I acknowledge** that there is public concern in Moranbah about the potential environmental impacts that the CRM, other BBCG project components and other mine projects in the area may have on the quality of life of local and regional residents. The issues of concern include air quality, noise and vibration, transport and traffic, accommodation and a range of social impacts that are addressed by the EIS and other parts of section 5 of this report.

To allay these concerns, **I have imposed** Condition 9(c), Schedule 1, Appendix 1 that requires the proponent to implement a community complaints register and response system (as committed to in the EM plan) to address, amongst other things, potential dust impacts. Condition 9(c) will operate irrespective of the complaint investigation responsibilities triggered by the EA Conditions.

**I also consider** that community concern about air quality, together with additional community concern about noise and vibration, traffic, accommodation and a range of social impacts of the CRM and the broader BBCG project (discussed in sections 5.7, 5.5, 5.9 and 5.11 of this report respectively) justifies a robust community liaison, communications and complaints response system. Therefore, **I have also imposed** in Schedule 1, Appendix 1:

- Condition 5 that sets out BMA's general CRM communication obligations
- Condition 6 that prescribes the establishment and operation of a Moranbah BMA Community Network (Moranbah BCN)
- Condition 7 that sets out the preparation of a specific CRM communication strategy
- Condition 8 that sets out the responsibilities of BMA's environmental management representative(s).

## 5.7 Noise and vibration

### EIS findings, submissions and analysis

BMA undertook an assessment of construction and operational noise and vibration for the Caval Ridge Mine (CRM) and included the findings as chapter 12 (Noise and vibration) and Appendix M (Noise and vibration impact assessment) of the EIS. The EIS outlines existing background noise of the mine site and surrounds and identifies potential construction and operation noise and vibration impacts (including blasting and transport/traffic noise) associated with the CRM.

The EP Act and the *Environmental Protection (Noise) Policy 2008* (EPP (Noise)) administered by DERM establish the framework for regulating noise and vibration associated with the CRM.

Operational noise levels emitted by the CRM were assessable in accordance with three DERM guidelines:

- *Planning for Noise Control*
- *Noise and Vibration from Blasting*
- *Assessment of Low Frequency Noise.*

Cumulative noise impacts that take into account existing ambient noise together with noise predicted from the mine are inherently factored into the criteria of the *Planning for Noise Control* guideline.

Rail noise from the new track and train load-out loop proposed for the mine was assessed against the criteria from the *Planning for Noise Control* guideline, as this was considered more stringent than the criteria of the EPP (Noise) and the *QR Code of Practice – Railway Noise Management*.

Chapter 19 of the EIS (Health, safety and risk) states that noise mitigation measures for all construction and operation equipment must comply with Australian Standard AS 2436-1981: *Guide to Noise Control on Construction, Maintenance and Demolition Sites*.

The EIS found that, in total, there were 26 properties within 12 kilometres of the proposed CRM considered to be at risk of noise and vibration impacts. The locations of these properties are shown in Figures 12.1 and 12.2 of the EIS.

The closest sensitive noise receptors to the site are 23 residences located within a distance of approximately 5 kilometres of the mine site boundary. These residences comprise:

- 12 residences located within a distance of approximately three kilometres of the CRM site boundary
- 11 residences located within a distance of approximately three to five kilometres of the CRM site boundary.

There are three other noise sensitive receptors located between five and 12 kilometres of the site boundary that are remote from the Moranbah township.

The Moranbah township (at its closest point) is located approximately five kilometres to the north of the CRM site boundary and includes the monitoring location, 66 Jackson Avenue, as a representative location.

To determine existing baseline levels, ambient noise was monitored at seven sites in the vicinity of the proposed mine and ambient vibration was measured at five sites.

Approximately 20 per cent of all submissions on the EIS raised concerns about noise and vibration. Many of these were Moranbah residents concerned about the potential impacts of mine blasting vibration on the structural integrity of buildings in the town. **I consider** that community concern about noise and vibration, coupled with additional community concern about air quality, traffic, accommodation and a range of social impacts of the CRM and the broader BBCG project, justifies a robust community liaison, communications and complaints response system.



Construction and operational mine noise (including blasting and transport/traffic) modelling was undertaken for the EIS, for three noise criteria: steady-state (L90); average (Leq); and maximum (Lmax). The modelling was undertaken under neutral and worst case weather conditions, using one construction and 11 operational scenarios, with reference to the recommended construction and operational noise criteria of the applicable regulations and guidelines.

Results predicted the construction noise criteria would be exceeded at none of the 26 properties within 12 kilometres of the proposed CRM. Therefore, BMA considered that specific construction noise mitigation measures were not warranted. However, general good practice measures, including community liaison strategies have been included in the EM plan.

Modelling showed the L90 operational steady-state noise criteria to exceed the 'acceptable level' (LA90) of 50 'acceptable decibels' (dBA), recommended in the Planning for Noise Control guideline, at three locations (locations 2, 6 and 7) under neutral weather conditions, and at one location (location 7) by 18 dBA under worst case weather.

Modelling showed the Leq operational average noise criteria to be exceeded at nine locations (1, 2, 3, 4, 5, 6, 7, 9 and 13) for neutral weather. Of these nine locations, five (1, 2, 3, 5 and 6) were owned by BMA at the time of preparation of the EIS and one additional property, Buffel Park (location 7) has been acquired recently by BMA. Under 'worst-case' weather conditions, the exceedance at one of these (location 7) increased by 5 dBA and three additional properties (locations 8, 10 and 11) were identified to have minor (up to 3 dBA) exceedences.

Modelling showed the Lmax operational maximum noise criteria to be exceeded at three locations (1, 2 and 4).

The highest level of modelled rail noise was 57 dBA LAmax, which is 7 dBA above the recommended 50 dBA limit. This is, however, below the 87 dBA LAmax criteria in the EPP (Noise) and QR's *Code of Practice – Railway Noise Management*.

Road traffic noise impacts due to the CRM were assessed to be negligible.

With regard to explosive blasting operations, modelling of ground vibration velocity and peak airblast at the 26 properties within 12 kilometres of the proposed CRM was undertaken, with reference to the DERM *Planning for Noise Control* guideline. Results showed that:

- the predicted levels of ground vibration were exceeded at six locations
- the predicted levels of peak airblast were exceeded at six locations.

All six of the locations (1, 2, 3, 4, 5 and 6) that experienced modelled exceedance of vibration and airblast levels recommended in the guideline were within 1.2 kilometres from blasting. Of these six unoccupied properties, five are owned by BMA and one is owned by another mining company (Anglo American Metallurgical Coal). BMA only considered mitigating the impacts of operational noise and vibration mitigation measures for those properties that it does not own.

The EM plan provides for specific noise and vibration operational mitigation strategies for those potentially affected properties not owned by BMA.

Modelling predicted that at two of those privately owned locations identified as exceeding noise criteria, compliance cannot be achieved by use of recommended mitigating measures. These were location 4, which exceeded the operational, Leq, LAmax, vibration and airblast criteria, and location 7, which exceeded operational L90 and Leq criteria. BMA proposed that at those two locations<sup>19</sup> the possibility of resumption or entering into an agreement with the affected property owner.

**I note** that BMA has commenced discussions with Anglo American Metallurgical Coal to enter into an agreement concerning management of potential noise impacts, and has purchased the Buffel Park property. These initiatives will mitigate a range of environmental impacts associated with the CRM, including blasting noise exceedence.

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<sup>19</sup> refer to EIS section 12.11.2. The two properties are identified as Location 4, 1/RP614378, owned by Anglo American Metallurgical Coal, and Location 7 Buffel Park, privately owned.



The EM plan provides a range of general control strategies for noise, vibration and blasting that BMA will implement, including a combination of permanent and short-term (non-permanent/mobile) monitoring and validation of actual noise levels, and a public complaints register with a two-stage response trigger. The EM plan also describes mitigation measures which address draft EA conditions provided by DERM on potential impacts of noise, vibration and airblast overpressure (blasting) nuisance. These draft conditions set noise level exceedance limits, and establish a framework for measuring, monitoring and complaints investigation.

The EIS concluded that there would be no adverse impacts on native or domestic (farmed) fauna due to mine noise and vibration.

In its submission to the EIS, Queensland Health disagreed with BMA's approach to not undertake any mitigation measures against low frequency noise and recommended that BMA mitigates against the potential adverse health impacts from low frequency noise.

Further to the EIS, BMA provided additional information within the SEIS (Appendix K, Low frequency noise) specifically to address Queensland Health's concerns.

In its response to Queensland Health, BMA indicated that it did not expect low frequency noise to be an issue for the proposed mine where noise is dominated by engine noise from mobile mechanical plant (rather than stationary plant). This is based on its experience with other mine sites, community consultation undertaken for the BBGC project and anecdotal advice from noise consultants experienced with public complaints concerning low level noise.

## Conclusions

In consultation with DERM, **I have stated** Conditions D1 – D17, Schedule 3, Appendix 1 for the EA that require the proponent to monitor, measure and mitigate actual noise, vibration and blasting impacts, especially where those are higher than those predicted by modelling undertaken for the EIS.

**I am satisfied** that the additional measures committed by the proponent and included in the EM plan are sufficient to implement the conditions of the EA.

**I am satisfied** that additional mitigation measures are not immediately required to address Queensland Health's concerns regarding potential low frequency noise impacts.

However, to allay any concerns, **I have imposed** Condition 9(c), Schedule 1, Appendix 1 that requires the proponent to implement a community complaints register and response system (as committed to in the EM plan) to address, amongst other things, potential low level noise and vibration impacts. Condition 9 will operate irrespective of the complaint investigation responsibilities triggered by EA Conditions D6(a), D9(a), D10 and D14(a). However, all relevant parties may agree to use the community complaints register and response system described in Condition 9(c), Schedule 1, Appendix 1 to fulfil the requirements of EA Conditions D6(a), D9(a), D10 and D14(a).

**I consider** that community concern about noise and vibration, coupled with additional community concern about air quality, traffic, accommodation and a range of social impacts of the CRM and the broader BBGC project (discussed in sections 5.5, 5.9 and 5.11 of this report respectively) justifies a robust community liaison, communications and complaints response system. Therefore, **I have also imposed** in Schedule 1, Appendix 1:

- Condition 5 that sets out BMA's general CRM communication obligations
- Condition 6 that prescribes the establishment and operation of a Moranbah BMA Community Network (Moranbah BCN)
- Condition 7 that sets out the preparation of a specific CRM communication strategy
- Condition 8 that sets out the responsibilities of BMA's environmental management representative.



## 5.8 Waste management

### EIS findings, submissions and analysis

The EIS (section 14, Waste management), provided discussion on the sources, impacts and management of solid, liquid and gaseous waste streams associated with the Caval Ridge Mine (CRM), excluding mining waste, in accordance with state and national statutory requirements, in particular the *Environmental Protection (Waste Management) Policy 2000* (EPP (Waste)). Waste is categorised as general, hazardous or regulated.

Section 5.2 of this report (Mineral waste) addresses mining waste that includes the overburden/interburden (spoil) removed to expose the coal resource and coarse and fine rejects from coal processing.

Based on BMA's experience with the nearby Peak Downs Mine (which is similar to the proposed CRM in size and operation), the EIS provided a general inventory of the non-mineral waste generated during the construction and operation of the CRM, and identified the waste type, source(s), management methods and approximate quantity for each.

The EPP (Waste) provides a preferred waste management hierarchy, which, from most preferred to least preferred method, is:

1. avoidance
2. waste re-use
3. waste recycling
4. energy recovery
5. waste disposal.

The EPP (Waste) also provides a set of waste management principles involving polluter pays, user pays, and product stewardship.

The EIS provided specific management methods for waste generated during the construction and operation phases of the CRM based on the waste type and source(s).

**I note** that the draft EA conditions, recommended by DERM, require the proponent to implement a waste management plan in accordance with the EPP (Waste)<sup>20</sup>, which will be subject to regular internal audits and review by BMA's Waste Management Coordinator (refer to EIS section 14.6.2). Management control strategies for waste must address:

- the type of wastes
- segregation of wastes
- storage of the wastes
- transport of the wastes
- monitoring and reporting matters concerning the wastes
- emergency response planning
- disposal, reuse and recycling options.

**I note** that the waste management strategies proposed by BMA in the EIS and the draft EA conditions recommended by DERM generally accord with the waste management hierarchy and principles of the EPP (Waste).

BMA has committed to prepare and implement an environmental management system for the CRM that will also address waste management with an aim to further minimising waste generated and improving waste disposal and management techniques.

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<sup>20</sup> Part 5, sections 18-21 of the EPP (Waste) states that the 'administering authority [i.e. DERM] may impose... a condition on an environmental authority requiring a relevant person [i.e. EA applicant - BMA] to prepare a waste management program for the authorised activities'. Note: the EPP (Waste) refers to a waste management 'program'.

BMA has also committed to track waste movement from the mine site in accordance with the requirements of a waste tracking system under the *Environmental Protection (Waste Management) Regulation 2000* that also requires waste transport certificates for the collection, transport and management of regulated wastes from the CRM site.

**I note** that the draft EA conditions recommended by DERM require the proponent to keep records of trade and regulated waste or material leaving the mining lease for recycling or disposal, including the final destination and method of treatment, in accordance with the EPP (Waste).

As discussed in section 4 of this report (Approvals), the EA for the CRM also provides authority for any environmentally relevant activities (ERAs) under the EP Act that occur on the mining leases. ERA 56, Regulated waste storage, and ERA 63, Sewage treatment, were identified in the EIS (section 1.7.1.1, Project approvals) for the CRM. Consequently, the draft EA conditions for waste provide conditions for the storage of regulated waste. The draft EA conditions for water (W55-W60) provide conditions for sewage treatment and disposal.

**I note** that other ERAs concerning waste management may occur on the mine site that are not included in the EIS documentation. These include:

- ERA 55 Regulated waste recycling or reprocessing
- ERA 57 Regulated waste transport
- ERA 58 Regulated waste treatment
- ERA 59 Tyre recycling
- ERA 60 Waste disposal.

The draft EA Conditions E1–E3, Schedule 3, Appendix 1 provide for the management of tyres and therefore address ERA 59. The waste management plan stipulated by draft EA Condition E4 addresses the other regulated waste ERA requirements. ERA 60, Waste disposal, is addressed by draft EA Condition E4 and draft EA Conditions E7–E12 that detail the requirements for any authorised spoil disposal facilities used for the disposal of non-mineral waste.

In its submission to the EIS, DERM requested a description of the construction methods associated with containment and disposal of construction spoil and solid and liquid handling.

In its response to DERM, BMA committed to place and mix inert construction spoil in designated mine spoil areas. Waste would be dumped in spoil and mixed into spoil with dozers. These areas would then be covered with pre-strip (soil), rehabilitated and managed to minimise surface exposure. The designated areas would be documented and identified in the construction and site EM plans.

In its submission to the EIS, IRC requested information on the process of disposing additional solid and sewage waste waters from the operation and the likely increase in the volume of this waste.

In its response to IRC, BMA committed to store, dispense and contain solid and liquid waste (e.g. construction fuels, oils and chemicals) within appropriately designed, bunded areas in accordance AS 1940-2004<sup>21</sup>. The sludge residue (approximately 15 tonnes per year) from the sewage treatment plants would all be removed from site by a licensed contractor and disposed of at an approved facility in accordance with IRC requirements.

Sewage waste water would be treated to Class A+ quality and used for irrigation on the site. Recycled water would be managed in accordance with the *Australian Guidelines for Water Recycling* (2006).

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<sup>21</sup> AS 1940-2004: The storage and handling of flammable and combustible liquids – Sets out the requirements and recommendations for the safe storage and handling of certain flammable and combustible liquids and dangerous goods.



## Conclusions

**I am satisfied** that the measures proposed in the EIS, the commitments made by the proponent, and the proposed EA conditions for non-mineral waste management to be included in the EM plan are sufficient to mitigate and manage any potential adverse impacts associated with non-mineral waste, including regulated waste.

In consultation with DERM, **I stated** the following conditions for the EA that require the proponent to monitor, measure and mitigate impacts associated with non-mineral waste:

- Conditions E1–E3, Schedule 3, Appendix 1 that require the proponent to provide for the management of tyres
- Condition E4, Schedule 3, Appendix 1 that requires the proponent to implement a waste management plan in accordance with the EPP (Waste)
- Condition E5, Schedule 3, Appendix 1 that requires the proponent to keep records of trade and regulated waste or material leaving the mining lease for recycling or disposal, including the final destination and method of treatment, in accordance with the EPP (Waste)
- Conditions E7–E12, Schedule 3, Appendix 1 that detail the requirements for any authorised spoil disposal facilities, used for the disposal of waste.

## 5.9 Transport and traffic

### EIS findings, submissions and analysis

#### 5.9.1 Context

Section 5.9 of this report provides analysis and conclusions concerning the development, upgrade, management and maintenance of the public (state-controlled and local government) road network required to service the Caval Ridge Mine (CRM).

The principal road access routes to and from the mine site are via the following roads (see Figure 3 of this report):

- Peak Downs Highway, which extends 276 kilometres from Mackay to Clermont
- Moranbah Access Road, which is the sole access between Moranbah and the Peak Downs Highway
- Winchester Road (Saraji – Dysart Road, also called Dysart – Moranbah Road).

The CRM is bisected by the Peak Downs Highway with the main mine industrial area (MIA) and coal handling and preparation plant (CHPP) on the southern side of the highway and the coal train load-out facilities on the northern side of the highway (section 13.3.4 of the EIS). To ensure the CRM can operate as a single integrated site, with no requirement for mining vehicles to interact with the highway, grade separation of the highway and the internal mine haul routes, which join the southern and northern sections of the mine, is required.

BMA has committed (SEIS, Appendix P) to construct a vertical realignment of the highway, retaining the existing horizontal road corridor. BMA will provide a diversion road on the south side of the highway during the construction period (see EIS Figure 2.4.1c).

A Traffic and Transport Impact Assessment (EIS, Appendix N), which details the mine's traffic impact on the state and council controlled road network, was prepared in accordance with the Department of Transport and Main Roads (TMR) *Guidelines for Assessment of Road Impacts of Developments* (2006).

Traffic and road impacts are expected to differ during construction and operation phases so have been considered separately. Traffic conditions were assessed for the year 2012, which was originally anticipated to be the last year of construction, 2013, the year operations were anticipated to commence, and 2023, the 10 year post-completion design horizon.

The two year construction period would generate the highest rates of traffic with an average workforce of 843 and average deliveries by 12 trucks per day. A peak six month period is expected within these two years, with truck deliveries of 52 trucks per day.

Light vehicle demands of the mine during the construction phase are expected to be substantially associated with employee movements. The heavy vehicle movements generated during the construction phase for the mine are expected to be almost entirely associated with the delivery of construction materials, the removal of wastes and the transportation of staff.

The preferred overland route for transportation of oversize modules is currently:

- Paget (Southern Mackay) to Eton (via Homebush Road)
- Eton to the turnoff to Moranbah (via Peak Downs Highway).

The planning process for transport of oversize modules would include a risk assessment and the development of a traffic management plan and traffic control plan. This plan will be submitted to the necessary approval authorities, including TMR.

In its submission on the SEIS, TMR recommended that BMA consult with TMR, the Queensland Police Service and Isaac Regional Council (IRC) regarding its program of oversized transport movements.



The mine operation phase would extend over 30 years, with an average workforce of approximately 495 staff and average deliveries of seven trucks per day. Staff would be predominantly transported by bus to the CRM from Moranbah and an accommodation village located in the vicinity of Moranbah, while goods and waste trucks are expected to primarily arrive from both Moranbah and Mackay.

Light vehicle demands of the mine during the operation phase are expected to be substantially associated with employee movements. The heavy vehicle movements generated during the operation phase are expected to be almost entirely associated with the delivery of consumables and the removal of wastes.

The traffic survey data analysed for the EIS (EIS section 13.3.2 and Appendix N) indicated that the operational morning and afternoon network peak periods generally occur at 6.15 – 7.15 am and 5.15 – 6.15 pm respectively, which reflects mine shift start and end times.

In accordance with TMR's scoping guidelines, the potential impact of the CRM has been assessed at the following intersections:

- Site Access / Peak Downs Highway (construction phase)
- Site Access / Peak Downs Highway (operation phase)
- Peak Downs Highway / Winchester Road
- Peak Downs Highway / Moranbah Access Road.

These are discussed in the sections below.

Generally, traffic associated with the CRM would impact upon the operation of nearby intersections and road links, necessitating several upgrades. Heavy vehicle traffic associated with CRM is likely to necessitate additional pavement maintenance on the Peak Downs Highway.

Of the 396 individual submissions received on the EIS, 17 per cent expressed concern about traffic impacts of the CRM, especially:

- the condition of the Moranbah Access Road
- BMA's contribution to road maintenance
- driver fatigue management.

## **5.9.2 Intersections, crossings and routes**

The measures discussed in this section aim to ensure that expected traffic impacts of the construction and operation of the CRM on the surrounding road network will be adequately mitigated. The roads in the vicinity of the CRM likely to be impacted are shown in section 3 of the EIS (Transport).

### **5.9.2.1 Peak Downs Highway/Site Access – construction and operation phases**

Section 13.5.3.1 of the EIS and section 2.2 of Appendix N to the EIS reported that a new priority controlled access off the Peak Downs Highway would be constructed to service the CRM during the two year construction phase, and that the mine would be accessed from the Peak Downs Highway, approximately 3.6 kilometres south of the Peak Downs Highway/Winchester Road intersection. In May 2010, BMA clarified this description and advised DIP that there would be two construction phase access points from the highway:

- one at the 5.1 kilometre point southwest of the Winchester Road on the south side of the highway which would be removed prior to commencement of operation of the CRM, and
- the other at the 3.6 kilometre point described above on the north side of the highway, which would be gated, to the satisfaction of TMR, and used infrequently by oversized vehicles.

**I am advised** that ongoing discussions between BMA and TMR since late 2009 on a draft infrastructure agreement have used this clarified description.

The intersection designs for each of these two intersections comprise short protected turn lanes on both approaches of the Peak Downs Highway (see Figures 13.3 and 13.4 of the EIS).

Section 13.5.3.1 of the EIS and section 2.2 of Appendix N to the EIS reported that, during operation, the mine would be accessed from the Peak Downs Highway, approximately 5.1 kilometres south of the Peak Downs Highway/Winchester Road intersection, and another new priority controlled access to the Peak Downs Highway would be constructed to service the CRM during the 30 year mine operation phase. In May 2010, BMA clarified this description and advised DIP that the one and only operational phase CRM access intersection would be at a point approximately 5.8 kilometres south-west of the Peak Downs Highway/Winchester Road intersection.

**I am advised** that ongoing discussions between BMA and TMR since late 2009 on a draft infrastructure agreement have used this clarified description.

The intersection design comprises short protected turn lanes on both approaches of the Peak Downs Highway.

### **5.9.2.2 Peak Downs Highway/Winchester Road**

The Peak Downs Highway/Winchester Road intersection is currently a priority-controlled intersection. The EIS assessment concluded that certain intersection performance parameters may be exceeded prior to 2023 irrespective of the CRM proceeding. Furthermore, it is anticipated that if the CRM proceeds, the intersection would fail to meet TMR's standards during 2016, which is 2.5 years earlier than if the proposed development was not to proceed.

The EIS (section 13.5.3.3) recommended that the existing intersection be upgraded to a 'seagull form' by 2016 to mitigate development impacts. The EIS noted that the recommended seagull form will not operate within TMR's standards at 2023, irrespective of the CRM proceeding (should traffic growth exceed projected 7 per cent per annum compound growth between 2008 and 2021) and would then require further redesign.

### **5.9.2.3 Peak Downs Highway/Moranbah Access Road**

The Peak Downs Highway/Moranbah Access Road intersection is currently a priority-controlled intersection. The EIS assessment concluded that if the mine proceeds, the intersection would fail to meet TMR's standards in early 2014, which is approximately 1.5 years earlier than if the proposed development was not to proceed.

The EIS (section 13.5.3.4) recommended that the existing intersection be upgraded to a seagull form by 2016 to mitigate development impacts. The EIS noted that the recommended seagull form would not operate within TMR's standards at 2023, irrespective of the CRM proceeding. Following its review of the SEIS, TMR recommended installation of left turn channels on the Peak Downs Highway at the Moranbah Access Road.

Potential upgrading works at the Peak Downs Highway/Moranbah Access Road intersection are currently being planned by TMR. Upgrading works of the CRM and TMR's own upgrading plans should be co-ordinated. **I note** that coordination between BMA, IRC and TMR on scheduling of proposed upgrades of this intersection is necessary.

BMA's workforce planning is based largely on fly-in-fly-out (FIFO) strategies (refer to section 5.11 of this report) and as such lends itself to organised bus transport between the mine site and the workers' village.

In its submission on the EIS, TMR was concerned about the potential for increased road safety risks at the Peak Downs Highway/Moranbah Access Road intersection if staff bus patronages to and from the workers' village are lower than forecast. Furthermore, in its submission on the SEIS, TMR recommended that BMA develops a 'statement of commitments' regarding the management of workforce movements to and from the site to prevent private vehicle use accessing the mine, which would improve the ongoing safety and



efficiency of use of the state-controlled road network. TMR requested that such a statement of commitments detail strategies, within a road-use management plan (RMP) approved by TMR, for ensuring proposed bus patronages are met in the longer term.

In its submission on the SEIS, TMR also expressed concern about whether the seagull form, proposed for the Peak Downs Highway intersections with both the Moranbah Access Road and Winchester Road, represented the safest design option, given the potential need for lengthy road-train acceleration lanes. TMR requested that BMA continues to liaise with its Mackay Regional Office to ensure intersection designs that safely accommodate mine-related traffic on the Peak Downs Highway.

#### **5.9.2.4 Principal road links**

Further traffic analysis was undertaken in the EIS for three linking sections of road vital to the CRM:

- Link A — Peak Downs Highway between Mine Site Access and Winchester Road
- Link B — Peak Downs Highway between Winchester Road and Moranbah Access Road
- Link C — Moranbah Access Road between Peak Downs Highway and Moranbah Railway Station Road.

The EIS concluded that no upgrade works to the roads links themselves (i.e. excluding intersections) were warranted.

As discussed in section 5.3 (Surface water resources) and section 5.5.4 (Aquatic ecology) of this report, and section 3.7.2.3 of the EIS, the CRM would require the diversions of Caval Creek and Horse Creek. In its submission on the EIS, TMR was concerned that the creek diversions would have the potential to significantly alter stormwater discharge to the Peak Downs Highway. BMA has committed to liaise with TMR to ensure that design of the mine works address stormwater impacts.

#### **5.9.2.5 Peak Downs Highway/mine site overpass crossing**

As described in section 5.9.1 of this report, BMA will construct a vertical realignment of the highway, retaining the existing horizontal road corridor, and provide a diversion road on the south side of the highway during the construction period. Figure 3.8 of the EIS shows the proposed vertical realignment of the Peak Downs Highway which would pass over the CRM.

In its submission on the EIS, TMR expressed concern about the road safety of members of the public who may stop on the overpass to view or photograph mine activity and/or mine vehicles. The design for the highway overpass includes visual and anti-throw screens to ensure public and mine-site safety.

All aspects of the design, construction and maintenance of the overpass will be governed by an Infrastructure Agreement between BMA and TMR and this is detailed in section 5.9.2.7 below. TMR requested that BMA continues to liaise with its regional office to ensure a design that satisfies this safety issue.

#### **5.9.2.6 Peak Downs stock route**

The Peak Downs Highway stock route follows the highway, traversing the central section of the CRM site (see Figure 3.2d of the EIS). In the EIS (sections 4.5.1.1 and 4.5.3.5), BMA proposed to realign the stock route at the proposed Peak Downs Highway overpass to ensure continuity of the route. In part, the proposed stock route deviation passes through MLA70403 to the south of the MIA, crossing under some associated mining infrastructure, including an elevated overland conveyor and light vehicle access road (under bridge) and haul road (under bridge). The stock route would be fenced to prevent any stock movements outside of the corridor.

In its submission on the SEIS, TMR requested that BMA include the provision of a practical and safe stock route access to the Peak Downs Highway, and recommended a condition of approval.



### 5.9.2.7 Infrastructure Agreement

BMA and TMR have an advanced draft Infrastructure Agreement to address the funding, construction and maintenance of key infrastructure identified for the CRM that impact upon the state-controlled road network. This Infrastructure Agreement specifically addresses:

- provision of the proposed Peak Downs Highway overpass that crosses a haul road, service road and conveyor between the south and north sections of the mine
- deviation of the Peak Downs Highway during construction of the mine haul overpass
- temporary access and road crossings
- dealing with utilities in the road reserves
- ongoing maintenance of the overpass
- traffic management plan
- access intersections to the mining operations
- maintenance contributions associated with mine traffic
- approval for works under the *Transport Infrastructure Act 1994*.

In its submission on the SEIS, TMR requested that BMA continues to liaise with its Mackay Regional Office to ensure the satisfactory completion of the Infrastructure Agreement and recommended a condition of approval. BMA has committed to further discussions with TMR in relation to matters concerned with the Infrastructure Agreement (SEIS, Appendix P).

**I consider** that development of an infrastructure agreement with the IRC to address the impacts of the CRM on local roads is also warranted.

### 5.9.3 Pavement impacts

The road pavement impacts of heavy vehicle movements on the state-controlled road network, generated during the construction and operation phases, were assessed in accordance with TMR's *Guidelines for the Assessment of Road Impacts of Development and Notes for Contribution Calculations*.

Analysis undertaken for the EIS indicated that, for most road links, the increased heavy vehicle loading due to the mine is negligible and would not significantly impact the timing of pavement rehabilitation works. BMA therefore contended that new contributions towards pavement rehabilitation are generally not warranted for the CRM.

Contributions towards pavement maintenance are warranted for the section of the Peak Downs Highway between the site access and the Moranbah Access Road / Peak Downs Highway intersection. The extent of the contribution to maintenance of this section of Peak Downs Highway proposed by BMA is itemised in the EIS (Appendix N, section 7.6).

In its submission to the SEIS, TMR noted that, although the EIS presented a pavement impacts assessment, requirements for maintenance contributions associated with CRM traffic would need to be finalised pending BMA undertaking a more detailed pavement impact assessment. TMR recommended a condition of approval concerning road impact assessment and maintenance contributions. These are to be detailed within a road impact assessment and road-use management plan to be approved by TMR.

### 5.9.4 Other transport and traffic issues

There are currently two school bus routes that use Peak Downs Highway to provide transport to the schools in Moranbah from Clermont and Coppabella. Traffic associated with the mine is not expected to significantly impact the existing school routes.

Within the EIS, TMR concerns were documented regarding driver fatigue, particularly relating to personnel driving to Mackay after completing a 12-hour shift. TMR has implemented a number of fatigue management measures on the Peak Downs Highway in recent years in



collaboration with the IRC, the mining industry and community groups. These measures include audible road line markings, 'driver reviver' awareness signage and provision of rest areas. BMA has recognised that further efforts to combat driver fatigue needs to be considered from a staff management perspective (e.g. the provision of a bus service to Mackay).

Chapter 19 of the EIS (Health, safety and risk) notes that licensed operators undertaking the transport of dangerous goods (ammonium nitrate) to the mine site must comply with the requirements of AS 1678.5.1.002: *Emergency procedure guide – transport – ammonium nitrate*.

In its submission on the SEIS, TMR noted requirements to ensure that ongoing safety and efficiency of the state-controlled road network are addressed in the TMPs and RMP for the CRM.

In relation to rail and port, **I consider** that:

- potential impacts of construction of the rail spur to the Blair Athol line are adequately covered in other parts of this report
- capacity issues on the Goonyella and/or Northern Missing Link/Newlands rail systems to cope with the additional volumes of coal produced by the CRM are best managed outside of the scope of this report through dialogue with other stakeholders in those rail systems including Queensland Rail (section 3.10.3.2 of the EIS)
- other planning, approvals and assessment processes are in place to manage capacity issues at the Abbot Point and/or Hay Point coal terminals (section 3.8.2 of the EIS) to cope with the additional coal produced by the CRM
- the issue of coal dust from trains is being adequately managed and dust issues are discussed in more detail in section 5.6 of this report.

## Conclusions

**I am satisfied** that the EIS process has adequately investigated and addressed the impacts of the CRM on the local and state-controlled road networks in the vicinity of the mine, during both construction and operation, including public and mine-site safety and efficiency and pavement impacts.

However, to ensure the satisfactory management of transport and traffic issues, **I require** the proponent to continue to liaise with TMR and IRC to ensure the completion of the Infrastructure Agreements, road impact assessments, an RMP and Traffic management plans for approval by TMR and the IRC.

With respect to Road Impact Assessments and the RMP, **I have imposed**:

- Condition 15(a)(i)-(ii), Schedule 1, Appendix 1, requiring the completion of more detailed road impact assessments
- Condition 15(a)(iii), Schedule 1, Appendix 1, requiring the preparation of an RMP in consultation with IRC for the approval of TMR
- Condition 15(a)(iii)C, Schedule 1, Appendix 1, requiring that the RMP includes a provision to address road pavement impacts
- Condition 15(a)(iii)F, Schedule 1, Appendix 1, requiring that the RMP includes a provision to address transport of workers between the mine and accommodation village(s)
- Condition 15(a)(iii)G, Schedule 1, Appendix 1, requiring that the RMP includes a provision that upgrading works at the Peak Downs Highway / Moranbah Access Road intersection be coordinated between BMA, TMR and IRC to address the cumulative traffic impacts of the overall BCG project
- Condition 15(j), Schedule 1, Appendix 1, requiring that BMA consults with TMR, the Queensland Police Service and IRC before obtaining the necessary permits for excess

mass or over-dimension loads associated with the CRM as required under the *Transport Operations (Road Use Management) Act 1995*.

With respect to road infrastructure agreements, **I have imposed**:

- Conditions 15(c) to (f), Schedule 1, Appendix 1 requiring Infrastructure Agreements that address:
  - the proposed Peak Downs Highway vertical realignment and underpass of CRM services ((c)(i))
  - the design requirements of TMR ((c)(ii)-(iv)) and IRC ((e)(i)-(ii)) for road intersection upgrades
  - the need for suitable stock route access to the Peak Downs Highway ((c)(v))
  - maintenance impacts of the CRM on state-controlled roads ((c)(vi)) and local roads ((e)(iii)).

**I have imposed** Conditions 15(h) and (i), Schedule 1, Appendix 1 that require the proponent to prepare traffic management plans in consultation with TMR, IRC and the Queensland Police Service to mitigate the specific impacts of all construction works in public road corridors.



## 5.10 Cultural heritage and Native Title

### EIS findings, submissions and analysis

The EIS (section 15, Cultural heritage) provided a record of the non-indigenous and Indigenous cultural heritage places, items and values associated with the Caval Ridge Mine (CRM) as part of cultural heritage investigations and presented a description of the process for identification and management measures for cultural heritage.

#### 5.10.1 Non-indigenous cultural heritage

No cultural heritage places within the CRM site were listed on the Queensland Heritage Register, the National and Commonwealth Heritage Registers or the Register of the National Estate.

Five 'places of historic interest' were identified within the CRM site but were not considered to have enough significance to justify further assessment or specific management measures. These are listed in table 8 below.

**Table 8: Place of historic interest identified within the CRM site**

EIS ID	Description	Discussion
HI-1	Telegraph line	Located approx. 500 m south of Peak Downs Highway. 15 timber posts approx. 100 metres apart. Extends 1.5. km NE/SW alignment. Not disturbed by CRM.
HI-2	Saw mill remnants	Located in central / southern section of site. Thought to be built in 1970s by landholder in response to preparation for Peak Downs mine. Not disturbed by CRM.
HI-3	Two dams and windmill	Located NW boundary of site. Damaged. Not disturbed by CRM.
HI-4	Cattle trough and yards	Located in northern section of site. In good working order and use. Will be removed during clearing for Horse Pit.
HI-5	Two dams and two windmills	Located in northern section of site. In working order. Will be removed during clearing for Horse Pit.

BMA would, where possible, retain three identified historical interest sites (HI-1, HI-2 and HI-3) but two sites (HI-4 and HI-5) would be removed during the clearing for Horse Pit.

It is possible that the site contains other artefacts of low-level cultural heritage significance, for example, associated with the old telegraph line, older roads or stock routes.

In its submission to the EIS, DERM requested BMA to identify a process for the mitigation of impacts to any places that may be of non-indigenous cultural heritage significance and which may be discovered during the construction, operation or decommissioning of the mine. DERM also requested that the mechanism for the recording and reporting of any such places to DERM should be identified in accordance with the requirements of the *Queensland Heritage Act 1992*.

BMA has committed to a range of general strategies in the EM plan to mitigate potential impacts on cultural heritage material found during the construction and pre-clearing activities for the CRM. These include regular cultural heritage identification and awareness training for employees.

BMA has committed to avoid disturbing heritage sites and places where possible, in particular places of state and/or national significance, including archaeological places or sites listed on the Queensland Heritage Register, in accordance with the *Queensland Heritage Act 1992*.

If any fossils are located during the construction and operation of the CRM, BMA has committed to advise the Queensland Museum.

## 5.10.2 Indigenous cultural heritage

BMA has consulted with the BaradaBarna Kabelbara and Yetimarla #4 group (BBKY) regarding matters of Native Title and Indigenous cultural heritage.

Following registration of a Native Title claim over the geographical area covering the Caval Ridge Mine by the BaradaBarna group (BB) on 9 October 2009 (see section 5.10.3 below), BMA has consulted with BB regarding Indigenous cultural heritage.

A range of indigenous cultural heritage places and items were located on the site and assessed for significance in accordance with the *Aboriginal Cultural Heritage Act 2000* (ACH Act) and other relevant guidelines, including the International Council on Monuments and sites (ICOMOS) Burra Charter. Desktop and field surveys documented numerous cultural heritage sites, items and natural features of indigenous origin and significance including:

- more than 1,200 surface stone artefacts of various types and material, mainly in association with watercourses
- 13 scarred trees
- 10 aboriginal fireplaces
- artefact 'knapping floors' (for flaking tools)
- a silcrete extraction site (e.g. quarry)
- a cultural stone feature
- a possible historic feature (probably the base of a water tank, of recent origin)
- natural features of cultural significance (certain landforms associated with occupation, artefact making and watercourses; and certain vegetation associated with traditional uses or native animals of significance to Aboriginal people).

The Horse Creek area, in particular, contained a significant variety of Indigenous cultural heritage. There was evidence of some grindstone artefacts having been recently damaged so larger artefacts found intact were removed from the site and placed into the custodianship of the BB people (traditional owners).

Under section 87 of the ACH Act, a cultural heritage management plan (CHMP) must be developed and approved where an EIS is required for a project.

Furthermore, under section 88 of the ACH Act, the CHMP must be developed and approved prior to obtaining the EA, unless the EA contains conditions requiring that an approved CHMP be in place before any activity occurs that could cause harm to indigenous cultural heritage.

BMA is also obliged under section 23 of the ACH Act to comply with the CHMP and the Act's duty of care guidelines to take all reasonable and practicable measures not to harm Aboriginal cultural heritage.

In its submission to the EIS, a third Aboriginal group, the BBKKY Native Title Steering Committee, disagreed with BMA's claims in all EISs relevant to the BBCG projects, that there has been comprehensive consultation and engagement with local indigenous people and the recognised traditional owners. In its response, BMA has committed to continue to work with the registered Native Title claimants, the BB people, for all BBCG projects. BMA considers that the BBKKY group is not the relevant Aboriginal representative group with regard to management of Indigenous cultural heritage or Native Title.

BMA has committed to and is now well advanced with the preparation of a CHMP for the CRM, in consultation with the traditional owners for the site, to fulfil the requirements of the ACH Act.

BB has now approved the final CHMP, which was signed by BMA and the traditional owners at a formal ceremony on 3 June 2010.



### 5.10.3 Native Title

The BBKY made their Native Title application to the National Native Title Tribunal (NNTT) on 31 July 2001. The application was registered by the NNTT on 5 April 2002. The BBKY application was later dismissed.

On 12 November 2008, a new claim over the geographical area covering the CRM was submitted by the BaradaBarna group (BB). This claim was registered by the NNTT on 9 October 2009.

BMA has entered into discussions with BB and is committed to ensuring that the Native Title interests are captured during community consultation and the EIS process and that an agreed CHMP is developed.

**I note** that the ACH applies to all aspects of the CRM and that the registration of the BaradaBarna Native Title claim has no effect on cultural heritage surveys carried out to date.

### Conclusions

**I find** that there will be some adverse impacts to both indigenous and non-indigenous cultural heritage as a result of the CRM. However, **I note** that the non-indigenous cultural heritage likely to be disturbed, particularly for Horse Pit, is of low significance. **I also note** that it is possible that the site contains other artefacts of low-level cultural heritage significance that may be encountered during the construction and operation of the mine.

**I note** that with regard to the cultural heritage element of the EM plan, a CHMP for the CRM is has been approved by BB at the time of drafting of this Coordinator-General's report to fulfil the requirements of the ACH Act.

**I note** that the concerns of the BBKYY Native Title Steering Committee regarding matters of Native Title and Indigenous cultural heritage. However, **I am satisfied** that BMA has consulted Aboriginal traditional owners in good faith and that this will be determined by DERM when assessing the adequacy of the CHMP for approval under the ACH Act.

**I note** the commitments made by BMA for strategies included in the EM plan to mitigate potential impacts on indigenous and non-indigenous cultural heritage material.

Therefore, **I am satisfied**, that the measures described in the EIS, SEIS, EM plan, and matters considered for including in the CHMP under the ACH Act, are sufficient to identify significant cultural heritage places and artefacts affected by the CRM, and mitigate and manage any adverse impacts to indigenous and non-indigenous cultural heritage.

## 5.11 Social impacts

BMA prepared a social impact assessment (SIA) as part of the CRM impact assessment process.

The CRM is the second EIS to be prepared for the BBCG project. As presented in more detail in section 2.2 of this report, the BBCG project involves the production of an additional 21.5 Mtpa of coal products through progressive development of four key components:

- the Daunia Mine for which my EIS assessment report was issued in October 2009
- the new open cut CRM (which is the subject of this report)
- a large expansion of the existing open cut and underground Goonyella Riverside Mine
- construction of a new increased capacity airport in the vicinity of Moranbah.

The management of the issues raised in the CRM SIA will be managed through the development of a Social Impact Management Plan (SIMP), which is discussed in detail in Section 5.11.1.2 of this report. The requirement for resource projects to develop SIMPs is a relatively new initiative of the Queensland Government's *Sustainable Resource Communities* (SRC) policy. It is currently envisaged that each mine will have its own SIMP.

It is possible that project proponents such as BMA operating a number of mines in a region, may consider combining individual mine SIMPs into a broader SIMP program or strategy. For example, it may become desirable in the future for social impact matters associated with the Daunia mine and the Goonyella Riverside mine expansion to be drawn together into a BBCG project SIMP. A BBCG SIMP may also evolve to become a broader BMA northern Bowen Basin SIMP. However, that approach would need to preserve the accountability of individual mine operations and would need to be the subject of future consultation with all key stakeholders.

**I note** that research conducted by the Central Queensland University and the QRC into the Bowen Basin has highlighted the need for mining companies (in partnership with key stakeholders) to contribute more effectively to the regional economic and social sustainability of the region. Various study recommendations have included the need to better identify, understand and mitigate the social impacts, including ways to address service delivery gaps, housing demand and workforce issues which are often present in mining communities. In the research, understanding of cumulative impacts is seen as an important element of providing a holistic approach to regional development<sup>22</sup>.

Almost 20 per cent of submissions on the EIS raised concerns about the potential impacts of the CRM on social or accommodation matters. A further 71 per cent raised concerns about wellbeing or amenity related measures such as air quality (34 per cent), noise and vibration (20 per cent) and traffic (17 per cent). It is clear from submitters that the cumulative impacts of coal mining activity in the northern Bowen Basin, particular on Moranbah, are matters of real community concern (see section 5.11.2 of this report).

For the purposes of this report, the key issues raised in submissions in response to the SIA section of the EIS are grouped in accordance with the following themes (with section numbers containing more detailed discussion of grouping shown in parenthesis):

- cumulative impacts (5.11.2)
- housing and accommodation issues (5.11.3)
- community health, safety and wellbeing (5.11.4)
- social infrastructure (5.11.5)
- workforce matters (5.11.6)

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<sup>22</sup> Miles B and Kinnear S (2008). Sustainable Regional Development in the Bowen Basin – Strategic Issues Paper, Central Queensland University



- employment and economic development (5.11.7)
- indigenous engagement (5.11.8)
- stakeholder engagement (5.11.9).

**I acknowledge** that BMA has a well established Community Partnership Program which, among other things, addresses some of the social impacts of its coal mining operations in the Bowen Basin. The scope and relevance of this program with respect to the CRM and the BBCG project is discussed in more detail in several of the subsections of 5.11 below. Given that:

- the extensive new SIMP requirements imposed by me on BMA as part of this report (refer initially to section 5.11.1.2 of this report)
- the evaluation of Community Partnership Program elements that will be required as part of the SIMP process, and
- the identification of several specific projects, programs and other measures that **I require** BMA to support to mitigate particular social impacts of the CRM identified during this EIS process.

**I have not required** a review of the total scale of BMA's Community Partnerships Program relative to the scale and type of social impacts caused by the BBCG project to be undertaken as part of this Coordinator-General's EIS Assessment Report. Notwithstanding BMA's own evaluation of its Community Partnership Program in 2009, and not pre-empting any outcomes of the SIMP process for the CRM, it might be argued that the scale of the program should 'keep pace' with the growth of BMA's business activities in the Bowen Basin. Therefore, **I recommend** (Recommendation 7, Schedule 5, Appendix 1) that:

- such a review be undertaken jointly by BMA and DIP as part of the EIS process for the Goonyella-Riverside expansion component of the BBCG project, and
- one relevant factor in the evaluation of the total size of that program should be the relative growth in the scale of BMA's business activities in the Bowen Basin resulting from the BBCG project.

## 5.11.1 Managing social impact in resource communities

### 5.11.1.1 General Government Policy

The SRC Policy was released in September 2008. It builds on the *Sustainable Futures Framework for Queensland Mining Towns* released by the Government in June 2007. The SRC Policy outlines the Government's commitment, in partnership with industry and local government, to strengthening SIA within existing EIS processes. The initiatives contained in the SRC Policy reinforce the principles of leadership, collaboration, corporate responsibility, sustainability, communication and community engagement.

As part of the SRC Policy, the Queensland Government has established an SRC Fund to improve social infrastructure in communities affected by mining industry growth. Approximately \$40 million has been allocated from this Fund to the provision of key social and economic infrastructure in the Bowen Basin during the period from January 2009-March 2010.

The SRC Policy identified improved social impact assessments as a core strategy to deliver better social outcomes in resource communities as they provide:

- an existing mechanism for identifying and appraising the social impacts and mitigating the adverse impacts on communities of proposed new or expanded major mining and petroleum developments
- an existing framework within which all stakeholders, including state and local governments, the resource industry, and the community can have input into the decision making process about resource development projects that will affect them.



### 5.11.1.2 New Social Impact Management Plan (SIMP) requirements

In line with the SRC Policy commitment to strengthen SIA processes, proponents of new or expanded major resource development projects requiring an EIS under either the EP Act or the SDPWO Act will now be required to develop a SIMP as part of the project approval process. SIMPs will also be required for projects for which DERM has given approval to a proponent to voluntarily prepare an EIS.

The purpose of a SIMP is to establish the roles and responsibilities of proponents, government, stakeholders, and communities throughout the life of a project for the mitigation and management of social impacts, benefits and opportunities that may be associated with the construction, operation and decommissioning of major resource development projects.

Social outcomes specified in a SIMP will be achieved by specifying the monitoring, reporting and auditing requirements, with nominated responsibilities and timing, to ensure that the commitments are met. A SIMP will also identify corrective actions if monitoring indicates that the performance requirements have not been met.

DIP's Social Impact Assessment Unit has prepared a draft SIMP guideline and a template to assist proponents with the development of a SIMP and these are currently scheduled to be finalised by July 2010 and the proposed legislative amendments program is planned for introduction by end of December 2010. At this stage it is envisaged that the program will involve amendments to the *Mineral Resources Act 1989* and the *Petroleum and Gas (Production and Safety Act) 2004* to provide an authority to require a mining or petroleum lease applicants for projects requiring an EIS under the EP Act to prepare a SIMP before the mining or petroleum lease is issued.

Proponents of resource projects currently preparing an EIS under Part 4 of the SDPWO Act are now being asked to submit a draft SIMP for approval by the Coordinator-General before the EIS Assessment Report is finalised. For example, the draft SIMP for the Queensland Curtis LNG project was released for public comment in February 2010, and the draft SIMP for the Australia Pacific LNG project was included in the EIS released for public comment between 23 March and 4 May 2010.

As the EIS process for the CRM was well advanced before the preparation of a SIMP became routine practice, **I have not required** BMA to undertake formal public consultation on a draft SIMP for the CRM during the EIS process. However, **I commend** BMA for preparing an early draft SIMP for consideration by DIP and **I note** that a full SIMP public consultation process will be required as part of the EIS for the expansion of the Goonyella-Riverside mine.

### 5.11.1.3 Early development of draft SIMP for the CRM

#### EIS findings, submissions and analysis

BMA identified the need for a SIMP, which it referred to as a 'social impact plan' in the CRM EIS SIA and associated documents.

Although the preparation of the SIMP is not a requirement specified in the TOR for the EIS for the BBCG project, BMA indicated to DIP during March 2010 that it is committed to develop and implement a SIMP to monitor social impacts associated with the CRM and to work with local service providers and stakeholders to develop practical solutions to matters identified in its SIA.

DIP has advised BMA that social impact mitigation and management strategies should be aligned with existing regional plans and government policies, strategies, programs and services to maximise their effectiveness and ensure that the future CRM SIMP addresses local and regional impacts. DIP has further advised BMA that social mitigation/management strategies in the SIMP should be drafted as actions with timelines and performance indicators so that monitoring of their effectiveness can be undertaken.

DIP and BMA agree that BMA's preliminary draft CRM SIMP requires further work to deal with social impacts identified during the EIS process.



## Conclusion

**I commend** BMA for commencing the process of preparing a draft SIMP for the CRM and its recent commitments to an ongoing SIMP process.

To reinforce this commitment and to demonstrate that BMA has given adequate consideration to the concerns raised in the EIS and SEIS submissions, and to ensure the mitigation and management of the potential social impacts identified in the SIA, **I impose** Condition 10, Schedule 1, Appendix 1 that requires:

- that BMA develop a SIMP for the CRM in collaboration with stakeholders in accordance with the SRC Policy 2008 and the DIP draft SIMP guideline and template
- within three months of advertising of the draft EA for the CRM, BMA must submit a draft SIMP to the Coordinator-General for approval prior to release for stakeholder consultation
- the SIMP must:
  - be consistent with the DIP SIA Unit *Draft Guidelines and Template Requirements (2010)*
  - contain social impact mitigation measures
  - contain key performance measures against which annual progress can be reported
  - be subject to review and audit every three years commencing at the end of the construction phase of the CRM
- the SIMP to incorporate the relevant imposed conditions in this report.

### 5.11.2 Cumulative impacts

#### EIS findings, submissions and analysis

As noted in section 3.2 of this report, a significant number of submissions on the CRM EIS and SEIS related to cumulative impact issues. Cumulative impacts include those effects which may increase over time, or be exacerbated by the intensity, scale, frequency or duration of a project both at a specific project site or remote to a project site.

Cumulative impacts of the CRM and BBCG project on the physical environment (especially land and water resources, ecology, noise, visual amenity and air quality) are discussed under the relevant parts of sections 5.1– 5.10 of this report. This section deals with the cumulative social impacts.

The TOR for the EIS for the BBCG project required BMA to assess impacts in terms of the likely response of affected communities and to identify possible beneficial and adverse impacts that are both immediate and cumulative. The TOR required BMA to consider these impacts both at the regional and local level and identify measures to address those impacts.

The submitters' comments on the CRM EIS identified a number of potentially positive and negative flow-on effects from cumulative impacts of the BBCG Project.

In particular, the IRC stated that the EIS needed to reflect the cumulative mining operations in the vicinity, with a focus on the economic, environmental and social outcomes. The IRC also submitted that a broad spectrum cumulative impact study is required to establish the baseline effects of mining being experienced by the urban community of Moranbah. In the IRC's view, this study should be contributed to by mining companies in the region.

In seeking community feedback on the CRM EIS on 10 August 2009, the IRC Mayor, Cr Cedric Marshall stated that:

*"the significant points of a cumulative concern to local elected representatives and the wider Council, that the community needs to respond to include: increased breathable dust in the town area; elevated dust deposition on residential premises; potential increased health impacts on young associated with breathable dust; reduction in residential amenity and liveability due to greater dust deposition across the Moranbah township; reduced local*

*residency of workers and families limiting economic growth opportunities for local businesses; and increased transport impacts on the Peak Downs Highway reducing all user safety because of transient work force” (Isaac Regional Council website)*

The IRC considers that the cumulative impact of expanded coal mining activities could result in deterioration of family and community values and the amenity of towns in the region such as Moranbah. Further, the IRC believes that if there is too much of an imbalance between resident and non-resident workers, then family life and businesses will be unsustainable in the longer term. To address these issues, the IRC urged BMA to collaborate closely with local and regional stakeholders through its *Community Partnership Program*, and proposed *Workforce and Community Cohesion Program*.

The IRC also expressed concerns about the cumulative demand of proposed major projects on housing availability in the region and the cumulative effects of the project on recreational facilities.

In response to the cumulative issues described above, **I note** that the IRC is establishing the Moranbah Cumulative Impacts Group (MCIG). **I am advised** that:

- the proposed membership of the MCIG comprises representatives of the IRC, DERM, DEEDI, Queensland Health, Education Queensland, the three mining companies operating mines or proposed mines closest to Moranbah (BMA, Vale and Anglo American Metallurgical Coal), unions, small business and the local community, but this membership has not yet been finalised
- the terms of reference for the MCIG have not yet been finalised
- the MCIG has initially identified community education and access to dust monitoring information as its first priority.

The IRC draft *2020 Vision: Community Plan* identifies community concerns about the cumulative impacts of industry development in the area, which ultimately led to the formation of the MCIG.

The SRC Bowen Basin Local Leadership Group, which includes the mayors of Isaac Region, Central Highlands Region and Banana Shire Councils, mining companies (including BMA) and community representatives, has also begun the task of considering the cumulative impacts of mining at the broader regional level.

In the CRM EIS cumulative impacts report, BMA indicated that it supports the development of a social impact plan and states that it will “... *manage the overall impacts of the project in consideration of the cumulative impacts of mining in the study area and region*”. BMA further states that it “... *is committed to making a difference in its communities by addressing key social challenges, the cumulative impacts of mining, and making a tangible commitment to improve liveability*” (EIS section 17:53).

BMA has advised in its response to the EIS submissions that in relation to social cumulative impacts “... *the combined effects of increases in the workforce are expected to place a strain on the region. The consultation and social impact assessment process initiated in this EIS will continue for other elements of the Project with a view to developing control strategies to minimise these impacts*” (SEIS section 17).

In BMA’s view, it is the role of the State Government to initiate and undertake a broad spectrum cumulative impact study to which BMA will contribute, as necessary. BMA has expressed its willingness to make a contribution to an independent body to assess the cumulative impacts of the resource industry across the various operations in the region.

In this respect, BMA refers to the *Discussion Paper on the Northern Bowen Basin and Mackay Regional Master Planning Exercise (February 2009)* which was developed in the context of DIP considering whether the *Whitsunday Hinterland and Mackay (WHAM) Regional Plan* should be upgraded to the status of a statutory regional plan.

The CRM EIS concluded that significant cumulative impacts (e.g. housing shortages and affordability, skill shortages, increased traffic on the Peak Downs Highway) will arise in Moranbah and surrounding communities as a result of the scale of planned mining activity if



key stakeholders including government and the mining industry do not undertake concerted action. The EIS stated:

*“While these issues will be exacerbated by the Project, it is considered that they are manageable. However, given the scale of mining planned in the region and if there is a lack of concerted action by key stakeholders including government and industry, there is a high likelihood that significant social impacts will occur in Moranbah and the surrounding communities.”*

Four cumulative impact descriptors were included in Table 20-1 of the CRM EIS (which was almost identical to the Table 20-1 in the Daunia EIS) against the category ‘Social’ for three components of the BBCG project. These are all workforce descriptors for the Daunia, CRM, and Goonyella Riverside mines respectively:

- peak total construction workforce (450, 1200, 900)
- peak construction workforce in towns (45, 90, 90)
- total operational workforce (300, 495, 700)
- operational workforce in towns (90, 150, 210).

Increases in traffic on the Peak Downs Highway were flagged in the Daunia EIS to be addressed in the CRM and Goonyella Riverside Mine Expansion EISs. **I note** that the EIS contained a Traffic and Transport Impact Assessment (EIS, Appendix N), which considers the mine’s incremental traffic impact on the local and state-controlled roads, including the Peak Downs Highway. **I also note** that traffic impacts on the Peak Downs Highway will be mitigated to some extent by the proposed adoption of a predominantly FIFO operational workforce for the mine. **I consider** that BMA needs to continue to work with TMR to mitigate any cumulative impacts of increased BBCG project traffic on the Peak Downs Highway.

Section 5.9 of this report deals with other matters related to the impacts of the CRM on safety of the Peak Downs Highway. In Schedule 1, Appendix 1, **I have imposed**:

- Condition 15(a) that requires the proponent to prepare a road use management plan (RMP) for the CRM to be approved by TMR
- Condition 15(a)(iii)G that requires the proponent to ensure, in coordination with IRC and TMR, that upgrades of the Moranbah Access Road intersection of the Peak Downs Highway specifically consider the cumulative impacts of the BBCG project
- Condition 15(a)(iii)H that requires the RMP to include measures to be implemented by BMA to limit workforce use of the Peak Downs Highway to those levels forecast in the CRM EIS and any updated projections in the RMP.

**I consider** that housing availability and affordability are also cumulative impact descriptors that could have been listed in CRM EIS. Pages 17-41 of the Daunia EIS proposed that the consideration of cumulative impacts such as housing shortages and affordability be left to the future through *“a collaborative approach from state and federal government, regional councils and mining companies....”*

The link between housing shortages in Moranbah and increased traffic movements on the Peak Downs Highway, which may also result in greater safety concerns on public roads and the need for additional emergency services capacity to respond to increased traffic accidents was mentioned but not addressed in either the Daunia or CRM EIS documents.

Housing matters are discussed in more detail in section 5.11.3 of this report.

Other cumulative impacts arising from historical mine development in the Moranbah area previously noted in section 17 of the Daunia EIS include:

- traffic increases on the Peak Downs Highway
- the departure of many families from the area to regional centres
- demographic changes such as an increase in the relative proportion of males in the population

- a drop in participation rates in sporting clubs and community organisations.

### **CRM EIS cumulative issues**

The key social cumulative issues identified in the CRM EIS were:

- project construction and operation placing greater demand on emergency services, health care, and housing
- cumulative environmental issues associated with noise, dust and vibration when combined with nearby mining operations
- increased road traffic and use of heavy vehicles on the Peak Downs Highway (locally and regionally)
- reduction in amenity and liveability of the community associated with noise, dust, vibration, and traffic cumulative impacts.

BMA stated that it will “*continue to play a part in industry and government initiatives aimed at monitoring and managing the cumulative impacts of growth across the region*”.

Given the size of both the BBCG project and the relative scale of BMA’s operations in the northern Bowen Basin, **I consider** that BMA’s contribution to the success of any joint strategy between industry, local and state government to address the cumulative impacts of coal mining in the northern Bowen Basin to be critical.

BMA currently participates in a variety of collaborative bodies which have been established or function to assist in planning for and addressing cumulative impacts such as the Mackay Whitsunday Regional Economic Development Corporation (MWREDC) and the Bowen Basin SRC Local Leadership Group.

**I note** that BMA is funding and implementing significant community programs as referred to Section 5.11.7 of this report. **I am also advised** that, in conjunction with other mining companies, BMA has also made financial contributions to the recruitment and retention of medical and childcare staff in the Bowen Basin.

**I note** that DEEDI is developing a draft *Cumulative Growth Management Framework* which will focus on economic scenario planning to assist the identification of potential economic futures and the preparation of population and employment forecasts.

**I note** that on 5 March 2010, the Queensland Government announced the preparation of a new statutory regional plan for the Whitsunday, Hinterland and Mackay (WHAM) region to help meet the opportunities and challenges associated with managing population growth and change. The WHAM Regional Plan will show where future growth is intended to occur. In the region, there is an urgent need to identify land that is suitable for residential development that does not have significant constraints such as susceptibility to coastal erosion, storm surge or flooding, or is otherwise constrained by the presence of wetlands, mining leases or good quality agricultural land.

A statutory regional plan can be used as the principal planning tool to address the issues facing the region. The new regional plan will also ensure that future growth and development occurs in a coordinated manner and balances social, environmental and economic needs.

### **Conclusion**

**I note** that the previous Daunia EIS concluded that significant cumulative impacts will arise in Moranbah and surrounding communities as a result of the scale of planned mining activity if government and the mining industry do not undertake concerted action.

The then Coordinator-General concluded in his report on the Daunia Mine project that “... *an analysis of BMA’s growth projects (including Daunia, Caval Ridge and the Goonyella Riverside Expansion) together with other resource projects in the Bowen Basin, needs to be assessed in some detail to determine the potential for significant cumulative impacts on social infrastructure in the region*”. **The then Coordinator-General further concluded** in that report that “... *identifying cumulative impacts and developing mitigation measures for new*



*projects is the responsibility of industry in partnership with local and state government and community sector stakeholders.”*

Therefore, **I confirm** that the cumulative impacts of BMA’s BBCG project components, together with other resource projects in the Bowen Basin, need to be assessed.

**I consider** that the new WHAM Statutory Regional Plan will provide the principal planning tool to address the cumulative impact issues of coal mining facing the WHAM planning region. This will assist with the management of future growth and development in the WHAM region, with the aim of such growth occurring in a coordinated manner that balances social, environmental and economic needs.

**I consider** it important that all mining proponents in the WHAM planning region fully participate in the development of the new WHAM statutory regional plan.

Therefore, **I make** Recommendation 8, Schedule 5, Appendix 1 that:

- the IRC and DIP jointly lead a study to identify the cumulative social impacts of mining in the Isaac Region local government area and the mitigation measures and social infrastructure required to address those impacts
- the study be conducted during 2010-2011 as a component of both the statutory IRC Community Planning process and the WHAM Regional Planning process
- DIP provide planning and technical resource support for the study and participate in the project management arrangements
- the cost of the study be met by the mining industry in approximate proportion to the total saleable volume of each mining company with operations located within the Isaac Region local government area.

In accordance with BMA’s significant role in coal mining in the Isaac Region, **I impose** Condition 17, Schedule 1, Appendix 1 that requires the proponent to:

- participate in the study of cumulative social impacts of mining in the Isaac Region local government area described in Recommendation 8, Schedule 5, Appendix 1 of this report
- contribute information about all of its operations in the Isaac region
- contribute \$150 000 towards the cost of the study
- collaborate with the state and local government agencies and other resource industry stakeholders in the study and in the development of cumulative social impact mitigation and management strategies in line with the findings of the study and the outcomes of the WHAM statutory plan
- ensure that the CRM SIMP includes BMA’s commitment to participate in the study.

### 5.11.3 Housing issues

#### Government policy and submissions on EIS

Project proponents are responsible for identifying and considering worker accommodation and broader housing impacts as part of their project development and planning and including an analysis of these issues in the SIA part of an EIS. Project proponents are also responsible for mitigating any adverse accommodation and housing impacts as a result of planned resource projects and for specifying mitigation strategies.

Mitigation strategies for any adverse accommodation and housing impacts must be based on a strong understanding of:

- any likely adverse impacts
- local and regional circumstances
- the nature and lifecycle of the resource project under consideration.

Together, the *Sustainable Planning Act 2009* and the *Local Government Act 2009* establish a range of planning mechanisms, including regional plans (e.g. the WHAM regional plan), local government priority infrastructure plans, community plans and planning schemes. These planning mechanisms must be taken into account by the proponent when considering worker accommodation and broader housing impacts and in development of any strategies to mitigate adverse impacts.

The Queensland Government's SRC Policy acknowledges that expansion of communities also brings challenges about planning for and handling growth in resource towns and regions. The SRC Policy focuses on resource communities and cites rapid development brought about by the resources boom as having significant impacts on community infrastructure, services, and the social structure of local and regional communities. This Policy supports better planning for, and responses to, housing issues in resource communities.

**I note** that DIP is currently engaging with the Local Government Association of Queensland (LGAQ) and the QRC with regard to the development of a *Sustainable Resource Communities Housing Policy* which is a key government commitment under the SRC Policy.

The Queensland Government's new Growth Management Strategy promotes effective and co-ordinated planning for growth in Queensland. Effective planning for resource communities is an important part of this strategy.

The Queensland Government is committed to the liveability of resource communities and to better linkages between land use, infrastructure delivery, economic development, environmental protection and affordable housing, as reflected in the recent establishment of Growth Management Queensland.

Partnership between the Queensland Government, local government, industry and community underpins consideration of accommodation and housing impacts of resource projects. The Queensland Government is committed to SIA and community engagement on growth management.

In the SEIS submission process, the Department of Communities (DoC) indicated that the IRC has a housing policy objective stating that mining proponents should endeavour to accommodate workers as follows: one third in detached dwellings in Moranbah, one third in high density dwellings, and one third in purpose built accommodation camps.

The housing market in Moranbah is characterised by low housing affordability, limited stock and low vacancy rates. Objectives of the IRC housing policy include attracting and retaining all sections of the community of Moranbah as well as providing a more stable and happy workforce.

DoC has advised that BMA should contribute to the provision of adequate affordable housing and support opportunities to create a greater diversity of housing choice within the township of Moranbah.

Housing is identified in the IRC Corporate Plan 2009-2014 as one of the Council's 10 local and regional issues. The IRC Plan lists the following two emerging opportunities and challenges related to housing:

- build and promote safe, friendly, strong and autonomous communities that have access to quality services, infrastructure and opportunities to participate in the community
- plan and develop strategies to provide and maintain affordable housing across the region using environmentally sustainable building practices.

Additionally, under the *Population change and development* key issue, the IRC Corporate Plan identifies encouraging people to work, live and play in the Isaac Region by promoting diversity and opportunity as a key opportunity and challenge.

BMA indicates that it actively works with local service providers and agencies to provide assistance where possible. BMA's Planning and Development Manager attends regular meetings with the IRC to enable effective communication sharing across future project activities including housing needs.



The QPS submits that housing for government service providers, such as police, should be allocated by the proponent as part of its housing stock development to mitigate the housing impacts on these agencies and to improve the attraction and retention of QPS officers and other government staff.

**I note** that the concerns raised by the DoC and the IRC in relation to affordable housing and the provision of housing choice within the township of Moranbah are justified.

#### **BMA responses to housing situation in Moranbah**

BMA states that as the largest provider of developed land and accommodation in Moranbah, it will continue to develop accommodation options for its workforce. This includes land development at the Isaac Views subdivision on the eastern side of Moranbah which will provide at least 167 residential lots and 200 unit sites.

A key goal of BMA is to increase diversity in accommodation availability. Of the BMA workforce currently housed in Moranbah, approximately 79 per cent live in low density accommodation, 3 per cent live in medium to high density accommodation, and approximately 17 per cent live in accommodation villages. These figures include both BMA employee home owners whose homes have been purchased with BMA assistance, and those living in properties owned by BMA.

BMA advises that it approaches accommodation from a business-wide, as opposed to a mine or project, perspective and is moving to increase the proportion of medium density and village facilities available to its employees.

BMA states that providing a choice of employment options across the business allows BMA the greatest opportunity to attract an on-going workforce to meet future operational needs.

BMA advises in the SEIS that it is supportive of a family friendly environment that is valued by the Moranbah community and actively encourages families to the region by supporting those workers who choose to reside in the community with appropriate housing options and will continue to support residential workers and the community through its ongoing commitment to community investment.

However from studies of existing employees, BMA acknowledges in the SEIS that a significant number of BMA employees who own housing in Moranbah live on the coast and are effectively drive-in-drive –out (DIDO) employees.

In its submission on the EIS, DoC argued that the DIDO practice along the Mackay to Moranbah Peak Downs highway is a workplace health and safety issue which would in part be alleviated by locating more housing in Moranbah.

In the SEIS, BMA strongly refutes DoC's view that the DIDO practice constitutes a workplace health and safety issue. For the CRM, BMA intends to provide structured travel options through planned FIFO, and bus travel options to address health and safety issues.

BMA indicates in the SEIS and subsequent verbal advice that FIFO is an important attraction and recruitment strategy and employees working under formal FIFO arrangements currently make up less than ten per cent of the permanent BMA workforce in IRC's local government area. By expanding the FIFO workforce, BMA expects to reduce the current high demand for residential accommodation in Moranbah and the demand on existing services and infrastructure and promote sustainable growth.

#### **5.11.3.1 Direct impacts from workforce for Caval Ridge Mine (CRM)**

##### **EIS findings, submissions and analysis**

The CRM will require a construction workforce of 1200 and an operational workforce of 495. For the construction phase, this number is presumed to consist of direct proponent employees, plus direct contractors engaged on the mine site, plus a pre-defined number of project infrastructure (e.g. road, rail, pipeline, electricity etc.) workers. For the operational phase, this number is assumed to exclude non-mine site workers.



The EIS (section 17.3) demonstrated that BMA recognises that the supply of accommodation in Moranbah and the surrounding area impacted by the BBCG project is under pressure and there is insufficient housing in Moranbah to accommodate the construction and operations workforces for the CRM.

### **Construction workforce**

The EIS stated that, for construction, the majority of the workforce is expected to be contractors and the majority of those would live in a temporary accommodation camp. The construction camp is proposed to be located initially at Denham Village, located on ML1775 which has existing approvals. Issues associated with the construction village location options, impacts and approvals are described in more detail in section 5.12 of this report.

While there is some inconsistency in the EIS, section 17.3.2 of that document provides estimates that 60 construction workers would be housed in Moranbah as a result of the worker's own choice of accommodation.

In April 2010, BMA provided verbal advice to DIP that, before it proceeds with the CRM, it may seek to amend the CRM definition such that:

- virtually zero construction workers may be accommodated in Moranbah
- it may use the Denham Village location as an initial 'fly-camp' for the first 12 months of construction while a new construction camp is developed off mining lease at an alternative site that is yet to be nominated.

While **I note** BMA's potential changes to the CRM, my assessment of accommodation proposals for the CRM contained in this report is based on the description contained in the EIS and SEIS documents.

**I consider** that the small proportion of the construction workforce living locally outside of a camp will contribute to competition for private rental accommodation in and around Moranbah unless BMA provides new dwellings for these individuals.

**I note** that the Denham Village site is less than ideal with respect to visual impacts, traffic and new intersection impacts with the Moranbah Access Road and worker comfort and health considerations arising from its close proximity to the mine site. While **I accept** BMA's existing approvals under ML1775 afford it the legal right to locate an accommodation camp at the Denham Village site, **I consider** that mitigation measures are required to reduce the impacts of the visual, traffic and intersection impacts of a construction camp at that location. My more detailed consideration of options and issues with respect to accommodation camps is provided in section 5.12 of this report.

**I indicate** that a future approach from BMA to the Coordinator-General to develop an alternative construction camp site to replace the Denham Village proposal would be considered on its merits.

### **Operational workforce**

The EIS provided the following estimates of the likely outcome for accommodation for the operational workforce:

- 10 per cent (50 people) would be sourced from existing residents
- 20 per cent (100 people) would choose to live in or around Moranbah
- 70 per cent (345 people) would choose to live elsewhere and take up FIFO, DIDO or bus-in/bus-out (BIBO) options.

Section 17.5.6 of the EIS indicated that operational personnel would be accommodated in a purpose-built accommodation village in Moranbah as well as housing provided through BMA's general housing strategy. Outside of this EIS process, BMA has obtained development approval for a new 304-unit accommodation village at the end of Belyando Avenue in Moranbah. **I am informed** by BMA that this facility will not be used to accommodate personnel involved with the BBCG project.



In April 2010, BMA provided verbal advice to DIP that subsequent to the finalisation of this Coordinator-General's report, it may:

- lodge a 'change request' under section 35C of the SDPWO Act to:
  - house close to 100 per cent of its operational workforce under FIFO/BIBO arrangements
  - proactively source operational FIFO mine workers from outside of Central Queensland, including from South-East Queensland (SEQ)
- lodge a separate development application with the IRC which may include:
  - a new 2000-person accommodation village on rural land off mining lease located well outside of Moranbah (and have that application assessed by either the Coordinator-General as part of the BBCG project or separately under SPA)
  - locate the main construction worker camp for the CRM on land adjacent to this new operational worker village to replace the Denham Village
  - accommodate operational mine workers from several of its other mines, potentially in addition to BBCG project mines.

**I note** BMA's potential changes to the CRM and:

- **I reiterate** that my assessment of accommodation proposals for the CRM contained in this report is based on the description contained in the EIS and SEIS documents
- **I note** that the Coordinator-General will consider any application for either a BBCG project change or a new development application for a component of the BBCG project on its merits at the time.

With respect to BMA's 70 per cent FIFO accommodation strategy, **I accept** that:

- temporary worker villages are now a widely accepted means of accommodating construction workforces in Australian resource communities
- in an increasingly competitive labour market, FIFO strategies coupled with operational worker accommodation villages will become a more prominent, flexible and cost effective part of recruiting and retaining mine operational workers
- some categories of resource workers, especially amongst the single-worker demographic, prefer FIFO arrangements
- in remote locations poorly serviced with existing infrastructure and for fledgling resource development regions, a predominantly FIFO strategy may have less impact on small and rural communities
- BMA has a history of supporting the local accommodation of its mine workers in the Bowen Basin.

However, **I also note** that:

- in established resource towns in the Bowen Basin, there has been some decline in the viability of some businesses and community organisations as the proportion of the non-resident population in and around those towns has increased
- a significant proportion of some demographic groups (e.g. married workers with young families) appears to favour local accommodation rather than FIFO arrangements, and many skilled and valued long-term resource workers will transition into and out of this demographic group over time
- most of the Bowen Basin resource communities now contain a proportion of second generation residents striving to develop the long-term sustainability of their towns and some of them perceive an over reliance on FIFO strategies to be a threat to that sustainability

- anecdotal information to DIP and Urban Land Development Authority (ULDA) staff on a range of resource projects has indicated that even with ambitious FIFO targets, either an operational worker village accommodation rate of over 80 per cent is rarely achieved or medium term 'leakage' of operational workers back to local accommodation of approximately 20 per cent might be expected
- the exact number of CRM operational workers included within FIFO arrangements at any point in time would be onerous to monitor and so any controlling conditions associated with FIFO arrangements will need to be simple to apply.

On balance, **I consider** that:

- BMA's proposal to accommodate 70 per cent of its operational workforce in a workers' village as described in the EIS and SEIS is acceptable
- while current evidence is that it may not be prudent to support a FIFO strategy of greater than 70 per cent of the operational workforce for the CRM, any such future application would need to be assessed on its merits at the time.

My consideration of worker village site impacts is provided in section 5.12 of this report.

## Conclusions

While, **I accept** BMA's existing approvals under ML1775 afford it the legal right to locate an accommodation camp at the Denham Village site, **I consider** that mitigation measures are required to reduce the impacts of the visual, traffic and intersection impacts of a construction camp at that location.

**I impose** Conditions 14(a)-(c), Schedule 1, Appendix 1 requiring BMA to provide new dwellings in Moranbah for any newly imported construction personnel living there if the number of such workers exceeds 12 (i.e. more than one per cent of the forecast peak CRM construction workforce). Any such new dwellings may be incorporated into BMA's broader Bowen Basin accommodation program at the completion of construction of the CRM.

**I note** that BMA will require new development approvals for its operational workers village(s) for the CRM and that sufficient information to allow the assessment of this aspect of the mine was not provided during the EIS process for the CRM. In previous cases where an accommodation village proposal could not be adequately assessed prior to the completion of the assessment report under the SDPWO Act, Coordinators-General have required that such off mining lease project accommodation villages be subsequently assessed through the integrated development assessment system (IDAS under SPA), with the local government conventionally being the assessment manager.

However, **I consider** that as the CRM is phase two of the four-phase BBCG project and **I have a continuing obligation to consider** the cumulative impacts of each phase of the project, impact assessment of a new construction camp for the CRM should be undertaken by the Coordinator-General in accordance with the existing TOR for this project. Therefore, **I impose** Condition 14(d), Schedule 1, Appendix 1 that requires the proponent to subject any new accommodation village proposal for the CRM for assessment as part of this significant project for the BBCG project. Such a process would involve the usual public comment period and close consultation with key stakeholders leading to the preparation of the Coordinator-General's report which would make recommendations about the village(s) to the IRC for its ultimate consideration of any development application made in accordance with SPA.

In light of the factors that **I have described** above, **I accept** BMA's proposal to pursue a predominantly FIFO strategy for up to 70 per cent of its operational workforce for the CRM. However, **I conclude that**:

- this acceptance should not be considered to set an automatic precedent for future phases of the BBCG project
- while current evidence suggests that it may not be prudent to support a FIFO strategy of greater than 70 per cent of the operational workforce for the CRM, any such future proposal would need to be assessed on its merits at the time.



Therefore, **I impose** Conditions 18(a)-(b), Schedule 1, Appendix 1 preventing BMA from accommodating more than approximately 70 per cent of its total CRM operational workforce (347 by estimates provided in the EIS) in operational accommodation village(s) or other FIFO/BIBO/DIDO arrangements.

Based on the application of an 70 per cent 'FIFO cap', **I also impose** Conditions 18(c)-(d), Schedule 1, Appendix 1 requiring BMA to honour its commitment to provide new dwellings in Moranbah to accommodate all new CRM operational personnel (148 BMA employees and/or contractors based on the CRM workforce of 495) and their families living outside of an accommodation village. **I do not consider** it appropriate to specify the style, configuration or density of this accommodation, or its method of delivery.

### 5.11.3.2 Broader housing impacts of the CRM

#### EIS findings, submissions and analysis

The EIS notes the lack of housing availability and affordability and the difficulties low and moderate income households have in gaining accommodation. The EIS provides some data on the housing market in Moranbah which establishes that rental costs are extremely high as are costs for purchasing properties. The EIS also indicates that lack of accommodation does not seem to be stimulating the market to construct more housing and that some constraining factors contribute to the shortage of land and accommodation. Neither the EIS nor the SEIS provide any information about mitigation strategies specific to the CRM or the BBCG project more generally.

**I note** that housing options for the accommodation of the operational workforce drawn from the existing housing stock in Moranbah are likely to have an adverse impact on the already stressed housing market in Moranbah and that this needs to be considered in mitigation strategies to be developed in the SIMP.

In recognition of the impact that the CRM and Daunia Mine will have on housing demand and costs for residents in the northern Bowen Basin, particularly in Moranbah, **I consider** that it is reasonable for the proponent to make a contribution to new affordable housing for non-resource key workers.

**I recognise** that there is an existing (and in some cases long-standing) complex arrangement of support provided by BMA to the IRC across a range of matters that influence the cost of living and the quality of services available in the local government area. This support includes special rates and contributions to town water supply. Therefore, **I consider** that it is reasonable for BMA to have some flexibility in the arrangements it reaches with IRC to meet its non-resource key worker obligations.

The ULDA has recently declared Urban Development Areas (UDAs) outside of SEQ with a view to increasing the availability of affordable housing in resource communities. **I note** the recent announcement by the Queensland Government in response to new mining developments that Urban Development Areas are to be developed in Roma, Moranbah and Blackwater, to be done in full cooperation with local councils, to deliver a total of 900 additional houses, most of them affordable, to take pressure off these local communities where housing is in short supply. **I consider** that there is a range of mechanisms through which BMA could collaborate with or support ULDA, together with IRC and DIP, to support the increase of the stock of affordable housing in Moranbah and elsewhere.

**I have considered** the cumulative impacts of the CRM and Daunia Mine and further planned mining development in considering how BMA should mitigate housing impacts. Given the current demand on the housing market in Moranbah (as evidenced by well above average rental and purchase costs for housing), **I believe** that government must consider the medium term impacts on housing generally in the town of Moranbah and surrounding areas.

The type of affordable housing 'dwelling' to be provided can be agreed between the proponent and IRC. As a guide, the proponent and IRC should take into account the range of household sizes represented in the group of low and moderate income workers (who are not from the resource industry) that the housing is targeted to and the need to use medium density accommodation to maximise the use of land provided and keep costs down. For

example, it would not be considered appropriate to provide predominantly three and four bedroom accommodation.<sup>23</sup>

The low and moderate income non-resource worker is a key worker providing services under a contract of service or contract in a resources region where the worker is not:

- engaged on resource level income
- part of a household with a resource industry income<sup>24</sup>.

In allocating contributions to meet BMA's obligations, the IRC shall ensure that the housing is held and managed solely for the purpose of affordable housing for key workers. The contribution should be made at a level which provides affordable housing of no lesser standard than the recent affordable housing project in Moranbah constructed by IRC.

While such contributions from resource project proponents might normally be expected to be distributed equitably throughout the impacted region or regions, consultation undertaken as part of the EIS process for this project with local government and the impacted communities indicates that the dwellings be best located in Moranbah for the CRM and Moranbah and/or Nebo for the Daunia Mine.

**I acknowledge** that it is difficult to determine the most appropriate scale of the proponent's contribution to address the impacts of the BBCG on the availability and affordability of housing in Moranbah. In assessing this matter, **I have considered**:

- BMA's commitments to its full accommodation strategy for its own operational workforce both within and outside of the context of the BBCG project
- BMA's broader historical and current contributions to the economic development of the region and community partnerships in the Bowen Basin
- my obligation to be consistent with Coordinator-General assessments of other contemporary resource projects in Queensland.

**I have considered** three alternative models to quantify the mitigation requirements in this regard:

- the provision of one dwelling per 40 total operational workers (i.e. 12 dwellings for the CRM and seven dwellings for the Daunia Mine) for non-resource workers
- the provision of one dwelling per 16 operational workers residing locally (i.e. 13 dwellings for the CRM and three dwellings for the Daunia Mine assuming 30 per cent of the operational workforce reside locally)
- the provision of one dwelling for each unit of accommodation utilised in the private rental or home ownership market in the area (but this model seems inappropriate for a distorted market such as Moranbah).

Recognising the circumstances that apply to BMA, Moranbah and the BBCG, **I am reluctant** to be prescriptive about BMA's precise contribution to meet its mitigation obligations, but **I am bound** to provide both a guide to meeting this obligation and a mechanism of monitoring compliance with any condition that I impose on this matter.

Following discussions with BMA about these alternative models, it has been agreed that:

- BMA will fund a detailed research study, the "*BBCG Project Housing Impacts Study*" to determine the impacts of all components of the BBCG Project (including the CRM and Daunia Mine) on the housing market in Moranbah and surrounding areas
- a terms of reference for the *BBCG Project Housing Impact Study* be developed in collaboration with key stakeholders for the approval of the Coordinator General

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<sup>23</sup> IRC and BMA may wish to examine the nature of housing provision in the recently constructed affordable housing project in Moranbah to develop their model.

<sup>24</sup> IRC and BMA may wish to examine the eligibility criteria for the National Affordable Housing Scheme to help develop their proposal on households that would be eligible for affordable housing.



- the study must include the identification of non-resource worker housing needs in the study area
- the results of the study will guide BMA to develop a “*BBCG Project Housing Impact Plan*” (the Plan) in which housing mitigation and/or offset measure to address the impacts described in the study are identified as a result of the proposed development of the BBCG project components
- further Coordinator General’s imposed conditions on housing provision for non-resource key workers (including on the CRM and Daunia Mine) may emerge from the Plan and these would be applied either as part of the Coordinator-General’s EIS assessment report for the Goonyella-Riverside Expansion component of the BBCG project, or, potentially, in a Change Report for CRM if BMA makes a change request that is relevant to this matter, and
- regardless of the emergence of any new project conditions, any requirements for proponent housing provision for the CRM and Daunia Mine identified in the Plan must be included in a revised CRM SIMP which is subject to approval by the Coordinator General.

### **BBCG project housing impacts study**

There is currently a gap in data available to estimate the impacts of resource projects on resource communities. This gap derives from the fact that ABS Census results are based on the usual resident population and ABS intercensal population estimates are based on the estimated resident population.

Hence, service populations, such as non-resident workers, are not accounted for in these statistics. Estimates of the size of this population component are currently only available through the Queensland Office of Economic and Statistical Research (OESR, which incorporates the Planning Information Forecasting Unit (PIFU)) which collates this information through a combination of collection methods from primary sources including surveys of accommodation providers and confidential collections of workforce projections from major resource project proponents.

Therefore, to ensure an accurate analysis of non-resource worker housing impacts of the CRM specifically and the BBCG project generally, the proponent must engage the OESR to undertake data collection and analysis relevant to the study.

The study must include:

- detailed demographic analysis including:
  - resident population estimates and age-sex population projections
  - dwelling and household projections
  - place of work / place of residence analysis
  - customised statistical local area and locality-level profiles utilising unpublished data from the 2006 Census, as well as OESR’s housing sales and rents databases
  - housing and accommodation – housing tenure, dwelling stock, sales volumes and prices
- housing demand and housing need by low and moderate income key workers
- a description and analysis of BMA’s current full suite of accommodation arrangements for all of its entire personnel (both direct employees and contractors engaged in all BMA business activities, including non-BBCG project activities) in the Whitsunday Hinterland and Mackay (WHAM) planning region, including existing and proposed FIFO/DIDO/BIBO arrangements
- the likely impact of each of the BBCG project component workforces on the housing market and on housing demand
- a description of the currently available options through the proponent for the provision of accommodation

- a framework which enables the proponent to develop a more detailed strategy for accommodating workers as well as for developing mitigation strategies in relation to housing impacts on non-resource key workers of each of the CRM project components.

The results of the study must be publicly available (but with OESR retaining the intellectual property rights of the data<sup>25</sup>) and be considered in future revisions of the CRM SIMP.

### **BBCG Project Housing Impact Plan**

The results of the study will guide BMA's development of the Plan. Pending the study's findings, housing impact mitigation and management strategies that address the following issues should be included (but not limited to) in the Plan:

- accommodation provision for BMA's workforce that are not housed in any project specific worker accommodation by a range of means including (but not limited to) direct supply of housing/units and facilitating joint ventures for construction of dwellings
- support for investment in non-resource worker housing
- accommodation advice services for workers and families wishing to settle in the BBCG project area
- specific recommendations on contributions to non-resource worker housing required to be made by BMA to specifically mitigate the impacts of each of the BBCG project components, and
- monitoring of the effect of any provision of affordable non-resource worker housing, and
- a requirement for performance review of the success of the workforce housing supply elements of the Plan.

The BBCG Housing Impact Plan should be presented to the Moranbah BCN for review and input. Consistent with the functions of the Moranbah BCN described in Condition 6, Schedule 1, Appendix 1, BMA must take into account any feedback on or suggested amendments to the Plan provided by the BCN.

Housing impact mitigation and management strategies stated in the Plan must be included in future revisions of the CRM SIMP.

### **Conclusions**

**I conclude** that neither the EIS nor the SEIS presents sufficient data to enable the description or quantification of the impacts of the CRM on the housing market in Moranbah or surrounding areas, especially with respect to non-resource workers. Therefore, following detailed discussions on these matters with BMA and a range of stakeholders, **I impose** Conditions 18(f) to (j), Schedule 1, Appendix 1 that require BMA to engage OESR to undertake the "*BBCG Project Housing Impacts Study*" (including the CRM and Daunia Mine) as outlined above in this section of the report.

**I emphasise** the importance of such a study in the context of the forthcoming EIS processes for further stages of the BBCG project and the cumulative impacts of this development in an already stressed housing market. **I consider** that OESR's access to unique and sometimes confidential data sources makes it the only feasible entity to undertake this study.

**I impose** Conditions 18(k) to (p), Schedule 1, Appendix 1 that require BMA to prepare a "*BBCG Project Housing Impact Plan*" (including the CRM and Daunia Mine) as outlined above in this section of the report.

**I also impose** Condition 18(q) which requires BMA to include the recommendations from the Plan in future revisions of the SIMP, and Condition 18(r), which clarifies that the Coordinator-General may impose the recommendations from the Plan in either the future Goonyella-Riverside Expansion EIS Assessment Report or any relevant future Change Report for any BBCG project component.

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<sup>25</sup> Intellectual property rights of data provided by BMA would be shared between BMA and OESR.



## 5.11.4 Community health, safety and wellbeing

### EIS findings, submissions and analysis

The key issues raised in submissions in response to the SIA section of the EIS can be grouped in accordance with the following themes:

- decreased levels of liveability for families (community identity, lifestyle and visual amenity) due to impacts from declining air quality, excessive noise levels, increased light, increased vibration (including property damage) and increased traffic impacts
- changes to age and gender structure of the community due to loss of families from the area and the increased percentage of local population subject to FIFO-DIDO workforce arrangements
- concerns about personal safety issues including domestic and family violence and alcohol-related violence
- limited capacity of council and state road infrastructure to safely support increased usage levels, including the Peak Downs Highway.

The assessment and management of community health, safety and wellbeing impacts is increasingly considered part of the risk management and social responsibility of mining and metals operators<sup>26</sup>.

In 2010, the International Council on Mining and Metals (ICMM) released a new document on this issue entitled *Good Practice Guidance on Health Impact Assessment*. The ICMM was established in 2001 to act as a catalyst for performance improvement in the mining and metals industry. ICMM's vision is one of leading companies working together and with others to strengthen the contribution of mining, minerals and metals to sustainable development. BHP Billiton is one of ICMM's 19 mining and metals member companies.

The *Good Practice Guidance on Health Impact Assessment* lists the key determinants of health and wellbeing as: environment, economic conditions, biological factors, lifestyle, personal circumstances, social influences, and availability and access.

A list of evidence-based community health and wellbeing indicators that are drawn from this document and relate to the social impacts of mining projects are listed in Appendix 5. These include chronic disease, physical injury, mental health and wellbeing, housing and accommodation, transport and connectivity, learning and education, and crime and safety.

#### 5.11.4.1 Liveability

The EIS and SEIS submissions raised concerns about decreased levels of liveability for families. In recently published work on factors that contribute to the liveability of an urban area, a sense of community is described as the degree to which a person feels that they belong to a readily available, supportive and dependable social structure<sup>27</sup>.

This work indicates that social interaction within a community may reduce social isolation and enhance community connectedness. By contrast, reduced interactions can have a negative effect on social capital, decrease social bonding, and the sense of belonging to one's neighbourhood.

Social interactions can be enhanced or restrained through the design of the neighbourhood. A sense of community can be associated with the social characteristics of place, and also connection with the physical characteristics of the built environment. The benefits of liveability in encouraging a sense of community include:

- physiological benefits for individuals resulting from improved interaction

<sup>26</sup> International Council on Mining and Metals. *Good Practice guidance on Health Impact Assessment. Guidance 2010-11*

<sup>27</sup> Queensland University of Technology High-Density Liveability Guide Fact Sheet 9 (2010)



- community benefits from an increase in the quality and quantity of social networks and connections (i.e. improved social capital)
- commercial benefits through improvements in the perceptions of the local area leading to higher demand for local goods and services.

It is clear that investment in social infrastructure is essential support for the health, safety wellbeing and economic prosperity of communities and regions in Queensland. It plays an important role in bringing people together, developing social capital, maintaining quality of life, and developing the skills and resilience essential to strong communities.

## Conclusions

**I recommend** that the community health, safety and wellbeing concerns raised in the EIS and SEIS and submissions be addressed comprehensively through the development and implementation of the social infrastructure section of the CRM SIMP in consultation with key stakeholders and the community as described in section 5.11.5 of this report.

### 5.11.5 Social infrastructure

#### EIS findings, submissions and analysis

Social infrastructure planning and delivery is a shared responsibility of local, Queensland and Commonwealth agencies and community organisations, with increasing participation from other interests, including the private sector.

The Queensland Government currently defines social infrastructure in the *SEQ Regional Plan 2005-2026 Implementation Guideline No 5 – Social Infrastructure planning (2007)* document as follows:

*“Social infrastructure refers to the community facilities, services and networks that help individuals, families, groups and communities meet their social needs and maximise their potential for development, and enhance community wellbeing. They include:*

- *Universal facilities and services such as education, training, health, open space, recreation and sport, safety and emergency services, religious, arts and cultural facilities, and community meeting places*
- *Lifecycle-targeted facilities and services, such as those for children, young people and older people*
- *Targeted facilities and services for groups with special needs, such as families, people with a disability, Aboriginal and Torres Strait Islander people and culturally diverse people”.*

The Guideline above is currently referenced in all DIP EIS TOR to assist proponents in determining what to include as social infrastructure in SIAs.

The CRM EIS (Section 17:17-60) identifies the following potential impacts on social infrastructure:

- there would likely be some increased demand for the community services offered in the study area, and to a lesser extent in the region
- while the project would be directly responsible for a proportion of this demand, it is more likely that the cumulative demands of projects in the region would continue to place pressure on community services
- childcare provision would be a key determinant in the availability of non-working partners, and there have been reported difficulties in accessing suitably qualified staff, due to lack of housing in the region, and
- BMA would continue to provide targeted support to this sector to help ensure high-quality; affordable, flexible childcare is available.

The key social infrastructure issues raised through EIS and SEIS submissions included:



- pressure upon local services due to increasing populations, with particular reference to the capacity of police and emergency services to meet service standards and respond to emergencies, resulting in:
  - reduced emergency response capabilities including disaster management planning (dangerous and hazardous goods, incident management), ambulance services and QFRS resources
  - increased negative impacts on policing resources due to increased levels of family violence, increased call outs for good order and alcohol-related behaviour and increased numbers of ‘oversized vehicles’ during the construction phase of the CRM
- pressure on resource and non-resource worker access to services for recreational and human service purposes e.g. ongoing impacts on human services in the WHAM planning region, arising from the population increase associated with the direct and indirect CRM workforces
- negative health impacts on residents due to dust emissions.

**I note** that a 2007 report prepared by the Moranbah and District Support Services<sup>28</sup>, funded by Blue Print for the Bush, found gaps in local medical services, support services for young people and intensive family support services including prevention and early intervention for children and families at risk<sup>29</sup>.

**I further note** that similar regional service gaps were identified in a 2008 research report prepared by the Central Queensland University. This report identified shortfalls in community infrastructure in the Bowen Basin Region, particularly in the medical, domestic and family violence and childcare services. The report was commissioned by the Minerals Council of Australia and the QRC.

**I note** that Queensland Health is currently undertaking planning processes to support the future delivery of improved health infrastructure in the resource communities.

**I note** that the SRC Fund has recently allocated approximately \$3.65 million to either upgrade, expand or construct six child care facilities in the region (Theodore, Blackwater, Moura, Clermont, Middlemount and Moranbah)—all of which are scheduled for completion during 2010. **I also note** that as part of the determination of SRC funding priorities, the Department of Education noted that addressing child care skills shortages is a current high priority.

## Conclusions

**I conclude** that a consistent message from the CRM EIS is that better social infrastructure planning and provision needs to take place. Good practice suggests that this planning and provision needs to occur at different levels (i.e. from neighbourhood to local to the state and commonwealth government levels) as ‘vertical integration’ is essential to securing adequate resources to meet social infrastructure needs. The provision of adequate time, opportunity and resources to enable input and ideas from local residents is also essential<sup>30</sup>.

**I recognise** that social infrastructure plays a pivotal role in supporting better community health, safety, and wellbeing outcomes. Therefore, **I recommend** that:

- BMA works closely with its Moranbah BMA Community Network (Moranbah BNC) (refer to Condition 6, Schedule 1, Appendix 1), the SRC Bowen Basin Local Leadership Group and the Queensland Government Central Queensland Regional Managers Coordination Network to prioritise social infrastructure needs in the CRM study area, and

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<sup>28</sup> The Moranbah and District Support Services is a not-for-profit, community based organisation that provides support, referrals and other services to families and individuals in need, living in the local community.

<sup>29</sup> *Coalfields Community Services Hub Proposal* prepared by the Regional Community Hub Steering Committee, 2007 (of which BMA is a member).

<sup>30</sup> Sharyn Casey (2005): *Establishing Standards for Social Infrastructure*. A publication by the University of Queensland Boilerhouse Community Engagement Centre.

- collaborative strategies to address these priorities are detailed in the CRM SIMP.

#### 5.11.5.1 Queensland Police Service

##### EIS findings, submissions and analysis

In its submission on the draft CRM EIS, the Queensland Police Service (QPS) identified that it anticipates the need for:

- one additional marked QPS vehicle for traffic patrols and wide load escorts
- staffing increases to the Central Police Region
- new police stations
- specialist resources and other equipment needs
- housing for government service providers such as police allocated by the proponent as part of its housing stock development to mitigate the impacts to these agencies and to improve attraction and retention of these officers.

QPS also raised in its submission that consideration should be given by developers regarding contributions to the cost of police vehicles.

QPS has requested that BMA consults directly with them regarding domestic violence issues in line with the requirements of the Queensland Domestic Violence Strategy.

QPS is also of the view that the proponent should:

- develop a safety training and awareness campaign for BMA employees
- review its disaster management plan and engage with QPS as part of Disaster Management Planning process
- consider incident management as part of the emergency management section of the CRM Disaster Management Plan.

BMA has advised in its EIS and SEIS responses that:

- it will include the QPS role in the response and investigation to death, injury or consequence of unlawful acts
- it will work with QPS on a safety education campaign (road safety) extending to all of the BMA communities
- a workforce fatigue management policy is a high priority
- it will develop a journey management policy
- it will undertake regular safety presentations on fatigue and journey management.

##### Conclusion

**I note** the concerns raised by the QPS in their submissions to the EIS and SEIS, as outlined above:

Therefore, **I impose** Condition 11(b), Schedule 1, Appendix 1 that requires the proponent to work with QPS on:

- a road safety education campaign extending to all of the BMA communities
- a good order code of conduct for BMA controlled accommodation villages
- the development, implementation and monitoring of fatigue and journey management policies
- planning and responses associated with impacts of the CRM, including potential increased demand on police service delivery issues listed above



- including collaborative strategies to monitor and address those matters in the CRM SIMP over which BMA has control.

### 5.11.5.2 Department of Community Safety

#### EIS findings, submissions and analysis

Department of Community Safety (DCS) anticipates that there will be increased pressure on existing emergency response capabilities, including disaster management planning (dangerous and hazardous goods, incident management), direct impacts on ambulance services, and QFRS resources arising from the CRM.

BMA advises that it supports a QFRS proposal for BMA personnel to be recruited as auxiliary fire-fighters.

In response to the CRM SEIS submissions, BMA advised that it is developing an emergency response plan and will consult with QFRS and other relevant stakeholders, including the IRC local disaster management group, during the formulation of the CRM Emergency Response Plan.

BMA also advised that:

- it will provide a copy of the CRM Disaster Management Plan to Emergency Management Queensland regional office
- work on the “CRM Emergency Management Queensland Procedure” will commence during the detailed design stage and it will be completed prior to construction work beginning on the CRM site
- the emergency and disaster management plans would normally be a single document for the site that covers both elements which will be referenced as “CRM Emergency Management Queensland Procedure”.

#### Conclusion

**I note** BMA’s commitments in regard to community safety and **I impose** Condition 11(c), Schedule 1, Appendix 1 that requires the proponent to fulfil these undertakings and include and monitor them in the SIMP.

### 5.11.6 CRM workforce

#### EIS findings, submissions and analysis

In its discussions with BMA following the release of the SEIS, the SIA Unit of DIP strongly recommended that BMA build on its current community involvement and its proposal to develop a workforce code of conduct with other companies by leading a partnership to progress a community safety planning approach. In DIP’s view, this approach would focus on reinforcing the strongly held family values of the region, promoting social order and crime prevention strategies, responsible drinking, reduction of domestic violence and sexual abuse, hospitality programs at local hotels, road safety, and improved town amenity planning (*Crime Prevention through Environmental Design*).

BMA has indicated that it will build on its code of conduct policy to ensure that leading practice is applied in the development of a Workforce and Community Cohesion Program and that suggestions regarding community planning will be further explored during the development of this program. This strategy will be implemented as part of BMA’s *Draft Five Year Communities Strategy for the Bowen Basin*.

A review of this draft Strategy document by DIP in relation to the Workforce Community Cohesion Program suggests that there be a focus on promoting a greater cohesion between BMA’s communities of interest and non-resident workers. Further, it is suggested that this could be encouraged by creating opportunities to buy locally on a cost competitive basis, ensuring that accommodation villages have in place the appropriate lifestyle attributes to attract and retain workers, partner support programs, education awareness on community

expectations, and development of a One-BMA standard regarding behaviour in villages and the community that represents industry leading practice. BMA indicates that the Strategy document and the One-BMA standard will be further developed during 2010-11 and become operational from July 2011.

The BMA Community Partnerships Program supports the *Good Sports Program* which targets work with community groups around the responsible service of alcohol. Additionally, the Kids Safety Clubs initiative will also engage primary school students and educate them about safety in the home and at school.

In its submission on the EIS, DoC stated that BMA should continue to develop workforce strategies to attract and retain women, people from different cultural backgrounds, and people with disabilities as stated in section 17.5.3.1 of the EIS. (BMA Diversity Strategy).

In its submission on the EIS, DEEDI advised that it is keen to assist the proponent to maximise employment opportunities for local people, including local Indigenous people.

Queensland Government's '*Positive dreaming, Solid Futures Indigenous Employment and Training Strategy 2008-2011*' includes initiatives aimed at fostering Whole of Government Agreements including a Memorandum of Understanding between the Queensland Government and the QRC that encourages mining companies to provide increased employment and enterprise opportunities for local Indigenous people. The Strategy also contributes to Queensland's efforts to meeting the Council of Australian Governments' target of halving the gap in Indigenous employment outcomes.

BMA advises that it is committed to workplace diversity and considers opportunities for all groups in the community. BMA has engaged a senior HR advisor for Diversity who has developed a Diversity Strategy, intends to support diversity throughout BMA, build a highly skilled workforce, and enable diversity to become embedded in the organisation. The strategy will apply to employment opportunities for women, Indigenous people, and people with disability, and ethnic groups.

## Conclusions

**I commend** BMA for demonstrating leadership in its commitment to workplace diversity by:

- engaging a senior HR advisor to develop a Diversity Strategy
- commencing the development of the BMA Workforce and Community Cohesion Program which aims to promote greater cohesion between BMA communities of interest and residents and non-resident workers
- seeking to create opportunities to buy locally on a cost competitive basis
- adopting an industry leading practice approach to workforce and community cohesion.

**I impose** Condition 11(d), Schedule 1, Appendix 1 that requires that the *One-BMA* Standard regarding the behaviour of BMA employees and contractors in villages and communities, which will be developed as part of the proposed *Workforce and Community Cohesion Program*, *BMA Draft Five Year Communities Strategy for the Bowen Basin*, and the *BMA Diversity Strategy* be incorporated into the CRM SIMP.

**I also recommend** (Recommendations 11(c) and (d), Schedule 5, Appendix 1) that:

- BMA engages with state and local government and non-government organisations (eg QPS, DoC, the IRC, Moranbah and District Support Services) to ensure that community safety mitigation strategies included in the final Communities Strategy focus on and reflect local priorities and concerns
- engagement processes to progress BMA's workforce and community programs be incorporated into the BMA Stakeholder Engagement Strategy as part of the CRM SIMP.



## 5.11.7 Employment and economic development

### EIS findings, submissions and analysis

Section 18 of the EIS notes:

- the increasing dependence of the economic base of the IRC local government area on the mining industry as the number and size of mines increase and the agricultural sector remains static or declines
- the consequential exposure of the Isaac regional economy to the fate of the coal industry
- the desire amongst the Isaac community to be less reliant on the coal industry even though the economic benefits of coal mining are well appreciated.

BMA confirms that it is the responsibility of the local community, IRC, the Mackay Whitsunday Regional Economic Development Corporation, the Queensland Government, and the mining industry to work together to ensure the economic sustainability of the local economy in the future.

DEEDI noted the significance and catalytic potential of the CRM and noted its support of the conclusions reached in relation to the social and economic benefits of the mine.

In order to support the IRC in addressing sustainable economic growth, BMA has implemented the following programs:

- financial support to the former Belyando, Broadsound, and Nebo Shire Councils to employ a Hinterland Economic Development Manager to promote the region to potential residents and tourists and establish an environment that will attract and retain small business and industry
- through the *BMA Community Investment Program*, for the 2008 financial year, an investment of \$22 million in Bowen Basin and Central Queensland communities
- establishment of the Community Partnership Program in 2002, which provides \$1 million per annum to the Bowen Basin region, including support for youth development, business and skills training, and development of welfare, community, safety, sport, wellbeing, recreation, arts, and entertainment initiatives.
- investment of \$3.25 million in the significant Landmark Development in 2007-08 financial year to further improve BMA host communities in coordination with state and Commonwealth governments, regional councils, and in some cases, other coal companies and industry bodies
- the provision of \$14.8 million in the 2008 financial year in regional infrastructure support including rates, special levies, and allocations including the maintenance of local roads and airports, and other council infrastructure, facilities and water
- the investment of \$925,000 per year (plus wages and salaries) in BMA's *Skills for Growth* program, which provides cadetships, scholarships, and engineering extension programs, as well as support for industry initiatives such as Queensland Minerals and Energy Academy, the Mining Industry Skills Centre, and the Coalfields Excellence Training Centre
- expenditure by BMA individual port and operating sites of around \$4.7 million annually in local sporting, community, and not for profit groups.

BMA advised that it will continue to implement and involve its *Community Investment Program* throughout the Bowen Basin. An avenue for the implementation and monitoring of any economic initiatives will be through the Moranbah BCN.

BMA advised that it encourages suppliers wishing to supply business or services to contact BMA's Supply Group which is based in Mackay and which manages the procurement of goods and services for BMA operations. This Group holds meetings with businesses across the Mackay and Bowen Basin regions, to detail BMA's compliance requirements for

prospective contractors and vendors and to keep well informed of the supply and business services capability within the region.

BMA has commenced auditing its operation sites and the accommodation village that houses BMA contractors and staff, to determine existing practices with regard to buying locally and investing in local business.

In the CRM SEIS, BMA advised that the audit outcomes may highlight additional local opportunities.

## Conclusions

**I commend** BMA for its supply practices and commencement of auditing of its operation sites and accommodation village to determine its existing practices with regard to buying and investing locally and supporting local businesses.

**I recommend** (Recommendation 11(e), Schedule 5, Appendix 1) that any outcomes of the audit which identify local business opportunities be the subject of consultation with members of the Moranbah BCN to determine how local businesses and residents can take advantage of these business and employment opportunities and ensure that any strategies devised are incorporated in the SIMP.

## 5.11.8 Indigenous engagement strategy

### EIS findings, submissions and analysis

In its EIS submission, DEEDI recommended that BMA include a commitment to Indigenous employment opportunities throughout the BBCG project. DEEDI offered assistance to the proponent to maximise employment opportunities, including for local Indigenous people.

**I note** that BMA welcomes the opportunity to work with DEEDI on these matters where possible.

In a submission on the EIS, the traditional owner group, BBKY, stated that it is seeking a formalised engagement strategy with BMA that is developed in collaboration with traditional owners and members of Indigenous communities. BBKY suggested that such a strategy include agreements outlining BMA's commitment to employment, business/enterprise, and training opportunities for Indigenous peoples that are signed off before approval of the CRM, and that any such commitments are monitored and reviewed.

**I also note** that BMA is engaged in ongoing consultations with the BB group.

**I consider** that the provision of culturally appropriate accommodation facilities and services to best promote employment opportunities for Indigenous peoples, requires further consideration by BMA.

BMA has advised that it is developing an *Indigenous Engagement Strategy* which will encourage Indigenous employment and business/enterprise opportunities in the community. This strategy is expected to be developed and ready for implementation by mid 2010. The strategy will investigate ways that Indigenous employment can be incorporated into the project. BMA has indicated that it is consulting with government and the community to develop the strategy.

**I recommend** (Recommendation 11(f), Schedule 5, Appendix 1) that during the development of this strategy, BMA discuss with Indigenous parties opportunities for the provision of additional support for Indigenous students to strengthen pathways from schooling to employment.

## Conclusions

**I note** that BMA's *Indigenous Engagement Strategy* will address training, education, employment and business development opportunities for local Indigenous people and **I support** this initiative as a means to build better relationships between BMA and Indigenous people in the region.



**I consider** that the strategy should also address the issue of culturally appropriate accommodation facilities and services that maximise support for employment of Indigenous people at the CRM; in particular alcohol free accommodation options to be developed with elders and their young people, through direct consultation with the traditional owners.

**I impose** Condition 11(e), Schedule 1, Appendix 1 that requires the proponent to include in its *Indigenous Engagement Strategy* specific details about its commitment to Indigenous employment, including school-based education, assistance and support programs, business/enterprise, and training opportunities. The strategy is required to be detailed in the CRM SIMP.

### 5.11.9 Stakeholder engagement

#### EIS findings, submissions and analysis

Overall, agency submissions on the CRM EIS and SEIS expressed a consistent need to maintain community consultation in a manner that promotes open dialogue with the residents and businesses, and keeps state and local government stakeholders and the community informed and consulted throughout the life of the CRM and the BBCG project.

BMA runs community network groups throughout the region to provide information and feedback on community needs and requirements. BMA Community Networks have been established to guide and monitor the BMA community investment strategy and activities. These networks comprise representatives from regional councils, educational institutions, health and community support services, traders, associations, employee partner representatives, and other community groups.

The Networks have been an important part of BMA's community engagement approach in developing the *BMA Draft Five Year Community Strategy*. Networks have met periodically (at least every 6 months).

#### Conclusions

**I recognise** BMA's community network process developed as part of the CRM EIS engagement strategy and their contributions to the Community Investment Strategies and in development of the *BMA Draft Five Year Community Strategy*.

However, as **I have discussed** in Sections 5.6 and 5.7 of this report, **I consider** that community concern about noise and vibration, air quality, traffic, accommodation and a range of other social impacts of the CRM and the broader BBCG project, justifies a robust community consultative process, liaison, communications and complaints response system.

**I consider** it important that the CRM has a stakeholder engagement strategy which:

- promotes an active and on-going role for stakeholders throughout the mine life cycle
- contains management strategies to ensure that stakeholder engagement processes are integrated into project implementation at site, local, regional, and state levels
- provides mechanisms to support a regular review of the effectiveness of the stakeholder engagement strategy and
- has complaint dispute resolution mechanisms to effectively and efficiently respond to stakeholder concerns about social impact issues throughout the life of the CRM and the overall BBCG project.

Therefore, **I impose** Conditions 5-9, Schedule 1, Appendix 1 that sets out BMA's community consultation and engagement obligations.



## 5.12 Workforce accommodation villages

Analyses of the impact of the CRM on accommodation matters and strategies to deal with those impacts are provided in section 5.11.3 of this report. As part of that analysis, I **concluded** that it would be reasonable to accommodate the construction workforce in a temporary facility and up to 70 per cent of the operational workforce in a long-term accommodation village based on FIFO/DIDO arrangements. This section covers my analysis of requirements for BMA's accommodation village proposals in the absence of a specific development application on a specific site.

### 5.12.1 Construction workforce

#### EIS findings, submissions and analysis

The EIS states that the construction workforce for the CRM is expected to peak at 1200 persons. The EIS further states that the construction camp is proposed to be located at Denham Village.

The Denham Village site is located on the eastern side of ML1775 (see Figure 3.3 of the EIS). BMA has existing approval for an accommodation camp on that site obtained outside of the SDPWO Act EIS process for the BBCG project. All aspects of development authorised under the *Mineral Resources Act 1989* are exempt from assessment under SPA.

The SEIS refers to the following information relevant to approvals for Denham Village:

- an amendment to the purpose of ML1775 (in an annexure to that lease) to include the construction and operation of accommodation facilities granted by the former Department of Mines and Energy on 27 January 2009
- an amended Plan of Operations for the Peak Downs Mine Plan that included activities associated with the construction and operation of the accommodation village approved by the former Environmental Protection Agency (EPA) on 2 October 2008.

The accommodation village is also referred to in the Plan of Operations July 2009 – June 2010 Peak Downs Mine, which was submitted to DERM on 14 December 2009 and which was approved by DERM on 20 January 2010.

BMA has advised that a new EA and Plan of Operations is proposed by BMA for the CRM, together with an amendment to the Peak Downs EA. The new EA and Plan of Operations for the CRM will need to address impacts associated with the construction of Denham Village and associated infrastructure.

As referred to in section 5.11.43.1 of this report, in April 2010, BMA provided verbal advice to DIP that, before it proceeds with the CRM, it may seek to amend the CRM definition such that:

- virtually zero construction workers may be accommodated in Moranbah
- it may use the Denham Village location as an initial 'fly-camp' for the first 12 months of construction while a new construction camp is developed off mining lease on an alternative site that is yet to be nominated.

I **note** that the proposed location of Denham Village is less than ideal with respect to visual impacts, traffic and a new intersection with the Moranbah Access Road and worker comfort and health considerations arising from its close proximity to the proposed mine site.

While I **note** BMA's potential changes to the CRM, my assessment of accommodation proposals for the CRM contained in this report is based on the description of the CRM contained in the EIS and SEIS documents.

On the basis of its existing approval and BMA's recently foreshadowed proposal to use the Denham Village site for only temporary accommodation during the first 12 months of construction activity, I **consider** that I should have no role with respect to the setting of more



detailed conditions on the design, construction and operation of the Denham Village on the ML itself. However, **I consider** that I have jurisdiction with respect to:

- ensuring that Denham Village provides sufficient and timely construction worker capacity until an alternative construction accommodation facility is established
- the intersection of the Moranbah Access Road with the access road to Denham Village (**I note** that in June 2010, BMA provided evidence to DIP of the IRC's conditional approval of the layout and design of the intersection between the Denham Village access road and the Moranbah Access Road)
- the provision of any other supporting linear infrastructure (e.g. electricity, water, telecommunications etc) for Denham Village outside of ML1775 that is not already approved
- assessment of the proposed forthcoming alternative proposal for a construction worker accommodation village (especially given that existing approvals for Denham Village have not been subject to any public scrutiny).

**I note** that BMA will need to prepare a Traffic Management Plan dealing with any impacts related to Denham Village on local roads and submit this plan to the IRC for approval (refer to section 5.9 of this report). **I also note** that BMA has provided evidence of the IRC's conditional approval of the layout and design of the intersection between the Denham Village access road and the Moranbah Access Road.

Submissions from IRC and the DoC on the SEIS focussed on issues relating to social impacts of the proposed use of a predominant FIFO workforce rather than the construction and operation of the proposed accommodation villages themselves.

The SIMP, referred to in section 5.11.1.2 of this report, will address the social impacts pertaining to the operation of the construction village.

## Conclusions

To ensure that the impacts associated with the construction workforce accommodation villages can be adequately mitigated, **I impose** in Schedule 1, Appendix 1:

- Condition 14(e), which requires BMA to endeavour to provide sufficient construction camp accommodation capacity at each stage of the CRM development either at the approved 'Denham Village' or at another location
- Condition 14(f) which requires BMA to fund and construct the camp access road intersection with the Moranbah Access Road during the first three months of the construction period of the CRM.

In consultation with DERM, **I also state** EA Condition F19 Schedule 3, Appendix 1 that sets out requirements in relation to the decommissioning of the camp and the prohibition of the use of the Denham Village site for accommodation of any mine operations workforce.

On the basis of BMA's advice that it proposes to only use the Denham Village for accommodation for the construction workforce for the CRM, **I recommend** (Recommendation 10, Schedule 5, Appendix 1) that within 12 months of commencement of operation of the CRM, the Denham Village be decommissioned, all camp buildings removed and the site rehabilitated in accordance with any requirements of the Plan of Operations for the CRM.

My conclusions and conditions with respect to assessment of future applications for construction accommodation on other sites are provided in section 5.11.3.1 of this report and Condition 14(d) of Schedule 1, Appendix 1 of this report.

## 5.12.2 Operational workforce

### EIS findings, submissions and analysis

The EIS states that the CRM will require an operational workforce of 495 persons.

The EIS indicated that BMA proposed that the majority of the CRM workforce, operating under FIFO/DIDO arrangements, will be accommodated during their shifts at a purpose built accommodation village to be constructed on a site to be determined by BMA in the vicinity of Moranbah.

As referred to in section 5.11.3.1 of this report, in April 2010, BMA provided verbal advice to DIP that, subsequent to the finalisation of this Coordinator-General's report, it may lodge a 'change request' under section 35C of the SPDWO Act involving, amongst other things, a proposal to house close to 100 per cent of its operational workforce under FIFO/BIBO arrangements.

As stated in section 5.11.3.1 of this report, my assessment of accommodation proposals for the CRM is based on the description contained in the EIS and SEIS documents. Any subsequent lodgement by BMA of a 'change request' would have to be considered on its merits at the relevant time.

My conclusions with respect to both policy and approvals process on BMA's operational workforce proposals are also presented in section 5.11.3.1 of this report and references to conditions that **I have imposed** about those matters are also provided in that section.

The remainder of the discussion in this section 5.12.2 deals with my generic advice and/or requirements about the development of an operational worker village for the CRM, irrespective of BMA's final proposals on this matter.

Should BMA wish to establish any workforce village on land that is currently designated as rural under the IRC planning scheme, BMA would need to submit a development application for a material change of use under SPA. Notwithstanding ULDA's role with respect to the Urban Development Area (UDA) declared over Moranbah, the IRC would be the assessment manager for any application made outside of the UDA, and TMR and DERM would be included amongst the relevant referral agencies.

**I consider** that it is important that an operations village servicing the CRM have sufficient and timely capacity to progressively house operations personnel so as to avoid putting pressure on existing accommodation in Moranbah. **I also consider** that operations village(s) servicing the CRM or other BBCG components should have sufficient periodic capacity to house visiting maintenance crews such as those associated with periodic scheduled maintenance/overhauls of draglines (which may number several hundred individuals).

As the CRM operation is predominantly based on FIFO arrangements, BMA proposes that a bus service will be the primary form of transport of operational workers to and from the CRM.

Section 5.9 of this report deals with transport matters for the whole of the CRM, including Road-use Management Plans (RMPs) and Traffic Management Plans (TMPs). However, as BMA will be seeking separate development approvals for the accommodation villages, separate accommodation village RMPs and TMPs will also be required. As discussed in section 5.9 of this report, an outcome of the RMP approval process is likely to be that BMA will enter into an Infrastructure Agreement with TMR for upgrades and maintenance of state-controlled roads impacted by the CRM, especially the Peak Down Highway.

The general head of power to require RMPs, TMPs and infrastructure agreements for projects impacting on state-controlled roads is the *Transport Infrastructure Act 1994*. SPA provides the head of power to require RMPs, TMPs and infrastructure agreements for local roads, or where a material change of use development application is required. Where development of an accommodation village off mining lease will require approval under SPA for a lot reconfiguration, then the statutory authority to require TMPs, RMPs or infrastructure agreements may be drawn from Schedule 7 of the *Sustainable Planning Regulation 2009* and the management plans may be required to address the objectives of the *Transport Planning and Coordination Act 1994*.

**I note** that BMA will need to prepare a TMP dealing with any traffic impacts arising from construction and operation of the worker accommodation village and submit these plans for approval to the IRC (for local roads) and to TMR (for state-controlled roads).



The SIMP referred to in section 5.11.1.2 of this report will address the social impacts pertaining to the operation of the operational workers village.

Measures pertaining to air quality and noise impact mitigation as set out in sections 5.6 and 5.7 of this report respectively will also apply to the operational workers village.

## Conclusions

The accommodation strategy assessed in this Coordinator-General's report relies on BMA providing an operations village in the vicinity of Moranbah that has sufficient and timely capacity to house up to 70 per cent of the CRM operations workforce as and when required. Notwithstanding my requirements under Conditions 18(b)-(d), Schedule 1, Appendix 1 for BMA to provide additional housing for its CRM workforce in Moranbah, **I also consider** it necessary to set a minimum proportion of the operations workforce that should be in village accommodation. Without such a minimum level, my assumptions about the impacts of the number of locally resident CRM employees may be invalid. Given that **I have capped** the maximum proportion of FIFO operational employees at approximately 70 per cent, and **I anticipate** that BMA will operate at close to this maximum cap, **I consider** that 60 per cent of the CRM operational workforce residing in villages to be a reasonable minimum requirement. This requirement is provided in Condition 18(e), Schedule 1, Appendix 1.

**I recommend** (Schedule 5, Appendix 1) that capacity planning for operational worker villages for the BCG project allow for the periodic accommodation needs of visiting maintenance personnel (such as the large dragline overhaul crews) in addition to operational personnel. **I also recommend** (Schedule 5, Appendix 1) that, within 12 months of commencement of operation of the CRM, the Denham Village be decommissioned, all camp buildings removed and the site rehabilitated in accordance with any requirements of the Plan of Operations for the CRM

**I impose** Condition 15, Schedule 1, Appendix 1 that requires BMA to submit TMPs and RMPs for the approval of the IRC (for local roads) and TMR (for state-controlled roads), relating to traffic management and movement respectively associated with the construction and operation of workforce village(s). The TMPs and RMPs must be approved before construction of any accommodation village may commence. Any conditions of approval of those TMPs and RMPs, including any consequential infrastructure agreements, should be implemented within the timeframes specified by TMR and the IRC.

Although no specific operational worker village development application has yet been made by BMA, **I note** that several community, local government and state entities (such as the ULDA) have expressed a preference for such facilities to be located in or near towns wherever possible and be integrated carefully with other urban development in those towns.

## 5.13 Greenhouse gas emissions

### EIS findings, submissions and analysis

#### 5.13.1 Construction phase

The EIS stated that the greenhouse gas (GHG) inventory for the Caval Ridge Mine (CRM) is based on the accounting and reporting principles in the Greenhouse Gas Protocol (2004)<sup>31</sup>. This protocol defines direct and indirect emissions through the concept of emission scopes.

Scope 1 emissions are direct greenhouse gas emissions from sources owned or controlled by the project. For the construction phase of the CRM, Scope 1 emissions are those associated with:

- fuel use by construction vehicles moving on or between work sites
- blasting using ammonium nitrate/fuel oil explosives
- on-site power generators.

Scope 2 emissions are mostly emissions from the generation of purchased electricity consumed by the CRM during the construction phase.

Scope 3 emissions are all other indirect greenhouse gas emissions resulting from CRM activities, but occurring from sources not owned or controlled by the CRM.

The EIS did not separately estimate GHG emissions for the construction phase of the CRM. However, it stated that a model had been developed to estimate CRM emissions for every year of construction and operation of the mine, according to the protocol and using methodology detailed in the National Greenhouse Accounts Factors (Department of Climate Change, 2008).

In May 2010, BMA provided an estimation of GHG emissions associated specifically with the construction of the CRM as set out in Table 9.

**Table 9: CRM construction phase Scope 1 and 2 GHG emissions and indicative offset calculations**

Construction year	Estimated emissions (Tonnes CO <sub>2</sub> -e)	Assumed offset price (\$/tonne CO <sub>2</sub> -e)	Indicative offset calculation (\$)
Year 1	35,000	20	700,000
Year 2	145,800	20	2,916,000

For comparison purposes, the annual GHG emissions associated with the operation of a domestic fridge are approximately 783 kg CO<sub>2</sub>-e and for a medium sized car are approximately 3.77t CO<sub>2</sub>-e. For the Northern Link Road Tunnel project, the total GHG emissions during construction were estimated at 32,000 tonnes CO<sub>2</sub>-e and the average annual GHG emissions during operation (e.g. tunnel ventilation and water management systems, lights etc., excluding GHG emissions from vehicles using the tunnel), were estimated at 18,000 tonnes CO<sub>2</sub>-e.

At an indicative offset price of \$20 per tonne of CO<sub>2</sub>-e, the value of an offset (if required) would be of the order of \$0.7 million for the first year of construction and approximately \$2.9 million for the second year of construction of the CRM.

<sup>31</sup> World Business Council for Sustainable Development & World Resources Institute 2004, *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* Revised Edition



### 5.13.2 Operations phase

The EIS contains an estimate of GHG emissions for the assumed 30 year operation of the CRM.

The Scope 1 emission sources from operation of the CRM included in the inventory are:

- fugitive emissions of coal seam gas from the open cut mining of coal
- diesel consumption in vehicles (consumption of petrol and gas in vehicles was excluded as these were considered to be relatively inconsequential)
- use of explosives.

The Scope 2 emission sources from the CRM result from the purchasing of electricity for draglines, CHPP, lighting and workforce facilities.

The Scope 3 emissions from the CRM are:

- transport of the coal via rail to the port, shipping of the coal and handling of coal at each transfer point to the end user
- end use of the coal in metallurgical applications such as the coking ovens of steel mills.

Table 10 provides a summary of the estimated GHG emissions for the operational phase of the CRM based on information provided in the EIS. The annual average emissions are approximately 272,000 tonnes CO<sub>2</sub>-e for Scope 1 and 99,000 tonnes CO<sub>2</sub>-e for Scope 2.

**Table 10: CRM operations phase GHG emissions and indicative offset obligations**

Emissions scope	Average emissions (tonnes CO <sub>2</sub> -e/yr)	Assumed offset price (\$/tonne CO <sub>2</sub> -e)	Indicative offset calculation (\$/yr)
Scope 1	271,895	20	5,437,900
Scope 2	99,305	20	1,986,100
Total Scope 1 and Scope 2	371,200	20	7,424,000

The EIS also estimated total average annual Scope 3 emissions of almost 15 million tonnes CO<sub>2</sub>-e. The EIS stated that Scope 3 emissions are not directly attributable to the CRM's operation and are not routinely reported by companies.

In a response in the SEIS about an enquiry on the cumulative effect of GHG production of the fly-in/fly-out (FIFO) arrangements for the CRM, BMA stated that the emissions associated with those FIFO arrangements would be immaterial when compared with the other Scope 3 emissions referred to above, even without consideration of the metallurgical use of the coal.

At an indicative carbon offset price of \$20 per tonne CO<sub>2</sub>-e, the cost of carbon offset (if required) for Scope 1 and 2 emissions combined would be \$7.4 million per year or \$222.7 million in today's dollars over the 30 year operating life of the CRM. Such an offset would obviously be a significant impost on the CRM.

### Conclusions

**I conclude** that Scope 3 GHG emissions should be excluded from any offset considerations of the CRM.

**I consider** that the GHG emissions from the construction and operation phase of the CRM are significant.

**I consider** that it would not be reasonable at this stage to impose a definitive offset requirement on the construction and operation phase of a high-volume commodity production project such as the CRM. Such an impost would be unprecedented.

To mitigate the carbon footprint for both the construction and operation phases of the CRM, **I impose** Condition 12, Schedule 1, Appendix 1 that requires the proponent to develop and implement a GHG Management Plan in relation to the Scope 1 and Scope 2 emissions of the CRM within three months of the granting of ML70403. The plan must include, but not be limited to, BMA's policy on GHG emissions, regular and accurate monitoring of GHG emissions from the construction and operation phases of the CRM, an energy efficiency program, a continuous improvement program and a fugitive gas management plan.



## 6. Matters of national environmental significance

### 6.1 Introduction

This section of the report addresses those sections of Part 5 of the *State Development and Public Works Organisation Regulation 1999* (SDPWO Regulation) that deal with the requirements of the Coordinator-General's report for proposals:

- declared as a significant project for which an EIS is required
- for which the Commonwealth Government has accredited assessment of the relevant impacts pursuant to the Queensland *State Development and Public Works Organisation Act 1971* (SDPWO Act).

This section provides the state's interim evaluation of the potential impacts of the project on the 'controlling provisions' being the 'matters of national environmental significance' (MNES)<sup>32</sup> under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act).

### 6.2 Controlling provisions of the project

On 20 August 2008, the project was referred to the Commonwealth Minister for the Environment, Heritage and the Arts for assessment under the EPBC Act. The EPBC Act establishes a Commonwealth Government process for environmental assessment and approval of proposed actions that are likely to have a significant impact on MNES or on Commonwealth Government land.

On 23 September 2008, the project was determined to be a 'controlled action' pursuant to section 75 of the EPBC Act—reference number EPBC 2008/4417. The controlling provisions of the EPBC Act are sections 18 and 18A (listed threatened species and communities).

The EIS process has been undertaken in accordance with the requirements of the Bilateral Agreement between the Queensland and Australian Governments, which accredits Queensland's assessment process for significant projects under the SDPWO Act. Therefore, the EIS was required to address both state and Australian Government matters.

Under the Bilateral Agreement, the controlled action may be considered for approval under section 133 of the EPBC Act once the Commonwealth Minister has the Coordinator-General's EIS evaluation report prepared under section 35 of the SDPWO Act.

### 6.3 EIS findings, submissions and analysis

#### 6.3.1 Context

'Matters of national environmental significance' is addressed in: chapter 8 of the EIS (Terrestrial ecology), Appendix C2 of the EIS (EPBC Matters Report), Appendix A1 of the SEIS (EPBC Assessment of Impact Significance on Listed EEC), and Appendix A2 of the SEIS (Biodiversity Offsets Strategy).

The controlling provisions of the EPBC Act are sections 18 and 18A (listed threatened species and communities)<sup>33</sup>.

<sup>32</sup> Part 3 Division 1 of the EPBC Act provides 'matters of national environmental significance'.

<sup>33</sup> Sections 178 and 179 of the EPBC Act provide and define six 'categories' of 'threatened species' of national environmental significance: extinct, extinct in the wild, critically endangered, endangered, vulnerable and conservation dependent. Sections 181 and 182 of the EPBC Act provide and define three categories of 'threatened communities': critically endangered, endangered and vulnerable.



Desktop analysis and field surveys conducted for the EIS found that no EPBC-listed threatened flora species were recorded within the study area. Six EPBC-listed threatened fauna species were recorded or identified as 'likely to occur' in the study area. Two endangered ecological communities (EEC) were confirmed as occurring in the study area:

- brigalow<sup>34</sup>
- natural grasslands<sup>35</sup>.

Potential impacts to EPBC-listed threatened species and communities would occur as a result of land clearing, land disturbance and mining activities.

The areas proposed to be cleared are on the land subject to an existing mining lease (ML1775) on which all but small areas are presently subject to various 'surface area approvals' under the *Central Queensland Coal Associates Agreement Act 1968* and the *Mineral Resources Act 1989*. ML1775, in its entirety, is the subject of an EA granted pursuant to the EP Act for the carrying out of mining activities.

Land on ML1775 would have been cleared as part of normal mining associated with the Peak Downs Mine. The Caval Ridge Mine (CRM) brings this clearing forward.

Section 6.3.4 of this report assesses the extent of EPBC-listed EECs on the CRM site with no approval for clearing, and so for which environmental offset is required. Section 5.5.1 (Terrestrial flora) of this report provides more detail for the assessment of native vegetation clearing that is a Queensland state interest under the *Vegetation Management Act 1999* (VM Act).

### 6.3.2 Threatened flora species

Desktop analysis identified the potential occurrence of the three EPBC-listed threatened flora species in the study area shown in Table 11.

**Table 11: EPBC-listed threatened flora species potentially present in the study area**

Listed flora species common name	Botanical name	EPBC Act status	NC Act status <sup>36</sup>
king blue-grass	<i>Dichanthium queenslandicum</i>	vulnerable	vulnerable
Queensland blue-grass	<i>Dichanthium setosum</i>	vulnerable	rare
finger panic grass	<i>Digitaria porrecta</i>	endangered	rare

Although there is an area of listed threatened natural grassland community under the EPBC Act on the CRM area (refer to Table 12 of this report), that community consists of the grass species *Dichanthium sericeum*, which is not an EPBC-listed threatened flora species. None of the EPBC-listed threatened flora species in Table 11 were identified in the study area by field surveys.

### 6.3.3 Threatened fauna species

Desktop analysis and field surveys conducted for the EIS identified the six EPBC-listed threatened fauna species listed in Table 12 as likely to occur in the study area.

<sup>34</sup> Full and correct name for the brigalow community is 'brigalow (*Acacia harpophylla* dominant and co-dominant)'. In Queensland, the brigalow ecological community that has been listed as threatened (endangered) under the EPBC Act is defined by reference to 16 regional ecosystems, all of which are listed as 'endangered' under the VM Act.

<sup>35</sup> Full and correct name for this community is 'natural grasslands of the Queensland Central Highlands and the northern Fitzroy Basin' (formerly listed as bluegrass (*Dichanthium spp.*) dominant grasslands of the Brigalow Belt Bioregions).

<sup>36</sup> Sections 71 and 76-80 of the *Nature Conservation Act 1992* (Qld)(NC Act) provide and define six 'classes' of 'protected wildlife' of state environmental significance: extinct in the wild, endangered, vulnerable, rare, near threatened and least concern.



**Table 12: EPBC-listed threatened fauna species potentially present in the study area**

Listed fauna species common name	Zoological name	EPBC Act status	NC Act status
southern squatter pigeon	<i>Geophaps scripta scripta</i>	vulnerable	vulnerable
ornamental snake	<i>Denisonia maculata</i>	vulnerable	vulnerable
Australian painted snipe	<i>Rostratula australis</i>	vulnerable	rare
greater long-eared bat	<i>Nyctophilus timoriensis</i>	vulnerable	-
yakka skink	<i>Egernia rugosa</i>	vulnerable	vulnerable
brigalow scaly-foot	<i>Paradelma orientalis</i>	vulnerable	vulnerable

Two of these EPBC-listed threatened fauna species have been identified in field surveys as being in the vicinity of the CRM area — the southern squatter pigeon and ornamental snake.

The EIS (section 8.2, and Appendix K section 4.3) describes the extent of suitable habitat for the EPBC-listed fauna species.

In addition to the six EPBC-listed threatened (vulnerable) fauna species, 19 EPBC-listed migratory bird species were identified to potentially use the study area. All of the species are relatively common and widespread across the regional landscape.

The EIS concludes that there is little evidence to suggest that the CRM area supports ‘important habitat’ for migratory bird species, whether they are wetland or terrestrial species, nor that the CRM area supports an ‘ecologically significant proportion of a population’ of any of the migratory birds known or considered likely to occur in the region.

Notwithstanding the EIS findings, the presence of migratory species is not an EPBC Act controlling provision<sup>37</sup> for the CRM.

Section 5.5.3 (Terrestrial fauna) of this report provides additional analysis on potential environmental impacts to migratory species as a matter of state environmental significance.

### 6.3.4 Threatened communities

Table 13 lists the observed regional ecosystems (REs) that occur on the study area indicating the EPBC Act (and VM Act) status and the estimated areas of EECs to be cleared as reported in the SEIS.

A map of REs in the CRM area is provided in Figure 7. The brigalow EEC is represented by REs 11.4.8, 11.4.9 and 11.9.5 and the natural grasslands EEC is represented by RE 11.8.11.

As a result of concerns raised by DEWHA on the EIS, BMA redesigned and relocated the coal conveyor corridor in the southern area of the CRM site, and narrowed the conveyor corridor width from 120 metres to 40 metres, to minimise clearing impacts and avoid habitat fragmentation.

This resulted in a decrease in the area of brigalow RE 11.4.9 identified for clearing by 2.3 hectares (i.e. clearing area of RE 11.4.9 reduced from 17.8 to 15.5 hectares).

The vegetation community area estimates shown in Table 13, as recalculated for the SEIS, take into account this reduced area of clearing.

<sup>37</sup> Listed migratory species is a controlling provision of sections 20 and 20A of the EPBC Act.

**Table 13: EPBC-listed threatened communities (regional ecosystems) from the SEIS**

RE	RE / EEC description	EPBC Act status	VM Act status <sup>38</sup>	Area to be cleared (ha)
11.3.2	<i>Eucalyptus populnea</i> woodland on alluvial plains		of concern	248.6
11.3.25	<i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland in Cainozoic clay plains		least concern	31.5
11.4.2	<i>Eucalyptus</i> spp. and/or <i>Corymbia</i> spp. grassy or shrubby woodland on Cainozoic clay plains		of concern	4.5
11.4.8	Brigalow: <i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains	endangered	endangered	8.2
11.4.9	Brigalow: <i>Acacia harpophylla</i> shrubby open forest to woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	endangered	endangered	15.5
11.5.3	<i>Eucalyptus populnea</i> and/or <i>E. melanophloia</i> and/or <i>Corymbia clarksoniana</i> on Cainozoic sand plains/remnant surfaces		least concern	100.0
11.5.9	<i>Eucalyptus crebra</i> and other <i>Eucalyptus</i> spp. and <i>Corymbia</i> spp. woodland on Cainozoic sand plains/remnant surfaces		least concern	217.3
11.8.5	<i>Eucalyptus orgadophila</i> open woodland on Cainozoic igneous rocks		least concern	25.1
11.8.11	Natural grasslands: <i>Dichanthium sericeum</i> grassland on Cainozoic igneous rocks	endangered	of concern	124.6
11.9.5	Brigalow: <i>Acacia harpophylla</i> and/or <i>Casuarina cristate</i> open forest to woodland on fine grained sedimentary rock	endangered	endangered	3.9

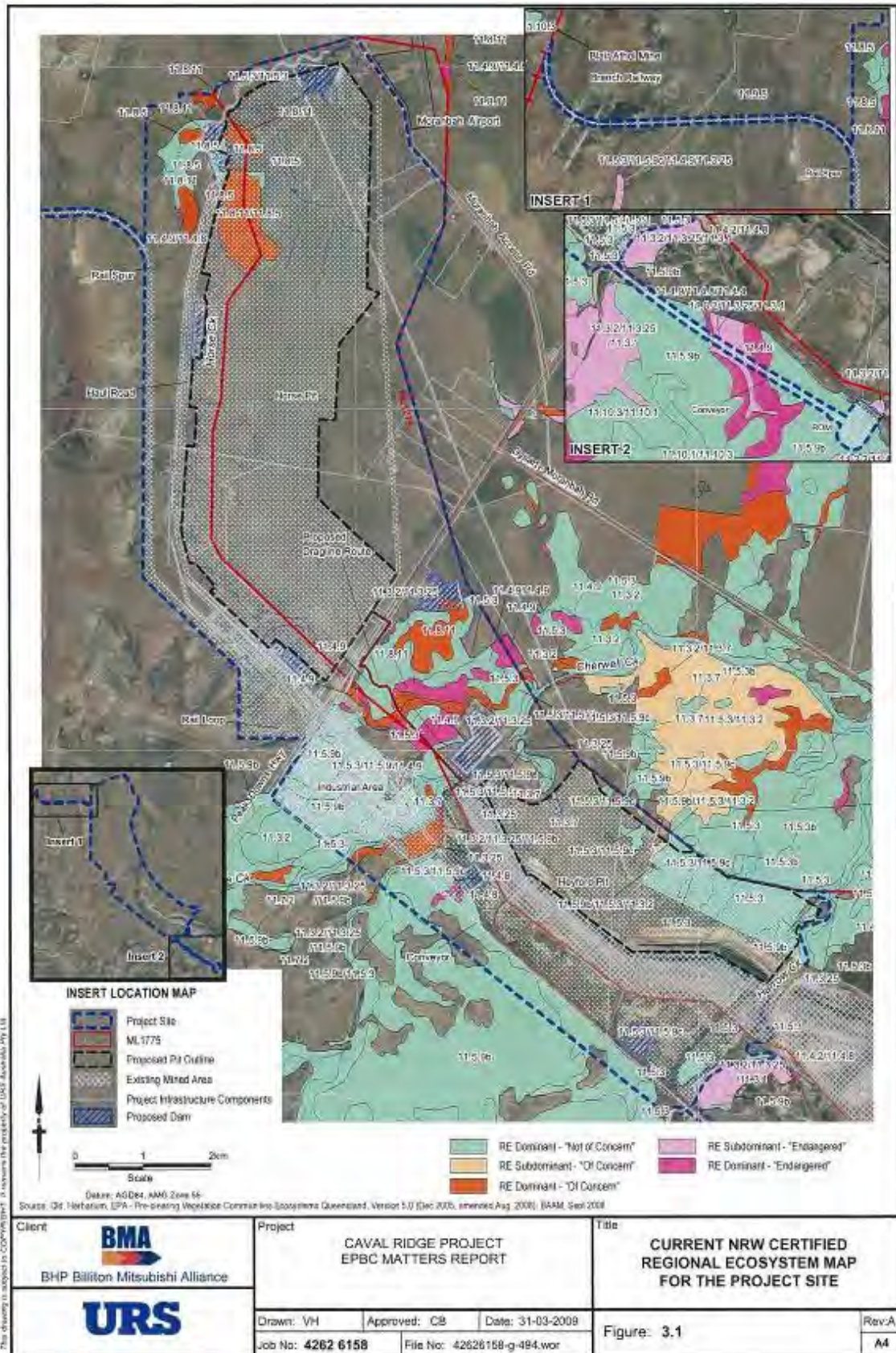
The ground-truthing of vegetation communities for the EIS found some deviation from the current RE mapping for the area certified by the Department of Environment and Resource Management (DERM). Of particular note was the absence of RE 11.4.9 south of Cherwell Creek and RE 11.9.5, both of which are classified as endangered under the EPBC Act and VM Act.

The areas of brigalow intended to be cleared were identified from field surveys to be highly disturbed and in poor condition, mainly due to infestation by buffel grass (*Pennisetum ciliare*). The areas of natural grasslands intended to be cleared were found to be heavily infested with parthenium weed (*Parthenium hysterophorus*). The areas of both brigalow and natural grasslands intended to be cleared were assessed to be relatively small, fragmented and isolated due to historical land use, and of poor ecological condition.

<sup>38</sup> Sections 22LA, 22LB and 22LC of the VM Act provide and define three categories of regional ecosystems: endangered, of concern and least concern.



Figure 7: Current DERM certified regional ecosystem map for the CRM site (from SEIS Appendix C2 Figure 3.1)



### 6.3.5 Potential impacts and mitigation measures

The assessment in the EIS of the potential impacts to EPBC-listed threatened species and communities, and the significance of those impacts, was made in accordance with the 'EPBC Act administrative guidelines on significance' (Environment Australia, July 2000). **I note** that these administrative guidelines on significance assessment were replaced by the '*Matters of National Environmental Significance Significant Impact Guidelines 1.1*' (DEWHA, October 2009), after the public review of the CRM EIS.

In response to the EIS submission from DEWHA, BMA undertook further assessment of the significance of impacts on listed threatened species and communities (SEIS Appendix A1 – includes additional cross-referencing to EIS chapter 8, Terrestrial ecology).

The EIS reached the conclusions for each EPBC-listed threatened fauna species listed in Table 14.

**Table 14: EIS conclusions – EPBC-listed threatened fauna species**

Listed fauna species	Significance of impacts – EIS summary
southern squatter pigeon	Due to the restriction of the mine footprint to existing cleared, modified and degraded lands, and the limited disturbance to suitable habitat from development of infrastructure, the impacts of the project on this species will be negligible.
ornamental snake	This species is relatively common and widespread across the regional landscape, and the project is not considered to have a significant impact on this species, its habitat or breeding/feeding resources.
Australian painted snipe	This species is relatively common and widespread across the regional landscape, and the project is not considered to have a significant impact on this species, its habitat or breeding and feeding resources.
greater long-eared bat	This species is relatively common and widespread across the regional landscape, and the project is not considered to have a significant impact on this species, its habitat or breeding and feeding resources.
yakka skink	This species is relatively common and widespread across the regional landscape, and the project is not considered to have a significant impact on this species, its habitat or breeding and feeding resources.
brigalow scaly-foot	This species is relatively common and widespread across the regional landscape, and the project is not considered to have a significant impact on this species, its habitat or breeding/feeding resources.

In summary, the EIS considered that none of the six EPBC-listed threatened fauna species are likely to suffer significant adverse impacts as a result of the proposed action.

Despite the assessment of the CRM on the individual fauna species outlined in Table 14, with respect to fauna communities, the EIS concluded that, although already degraded, both the brigalow and natural grasslands EECs would be adversely impacted by land clearing for the CRM, and that this impact required offset by the protection and management of corresponding suitable areas.

In response to the EIS submission from DEWHA, the SEIS acknowledged indirect impacts (non-clearing) to brigalow EECs due to mine construction and operation (e.g. dust, habitat fragmentation). Also, BMA has redesigned and relocated the coal conveyor corridor in the southern area of the CRM site to minimise clearing impacts and avoid habitat fragmentation. This resulted in a decrease in the area of brigalow (RE 11.4.9) identified for clearing by 2.3 hectares.



BMA has committed to undertake additional management activities to mitigate impacts to MNES as outlined in section 5.4 of the EPBC Matters Report (EIS Appendix C2). These include such measures as control of pest vertebrates (e.g. red foxes and cats) and weeds (e.g. *parthenium*), assisted natural regeneration and active rehabilitation where practicable, improved habitat connectivity, traffic management, livestock exclusion, dust suppression, provision of aquatic habitats, retention of selected large and/or hollow-bearing trees and logs, and ongoing flora and fauna monitoring.

While I acknowledge BMA's commitments to implement management measures to further mitigate the impacts of the CRM on ecological values, including MNES, and the incorporation of these commitments into the draft EM plan as reported in Appendix O of the SEIS, I note that these commitments are generally broad in nature. **I consider** that:

- more specific mitigation measures should be documented in the Construction EM plan during the period of construction of the CRM and the Site EM plan
- that these new measures be subject to the approval of both DERM and DEWHA prior to the commencement of operation of the mine<sup>39</sup>.

### 6.3.6 Offsets

#### 6.3.6.1 Identification of areas requiring offset

In its submission to the EIS, DEWHA requested additional information concerning environmental offsets, especially for the natural grasslands EEC, noting the presence of current mining leases or exploration leases on land proposed for offsets. In its submission, DEWHA also requested additional information concerning the classification and extent of vegetation that had been previously approved for clearing for the Peak Downs Mine (i.e. approvals prior to July 2000). BMA subsequently provided this information in the SEIS, using information sourced from the registered surface area survey plans 1–7, issued between 22/12/1983 and 11/1/2000 for ML1775.

Table 15 provides a summary of the vegetation communities to be cleared for the CRM. The total area of vegetation in the immediate CRM study area is almost 1480 hectares. Of this, a little over half (approximately 780 hectares) will be cleared for the CRM. Of this amount, a quarter (approximately 192 hectares) has approvals provided by January 2000 for clearing under the existing ML1775. Prior approvals involve only seven hectares of EECs under the EPBC Act. The area requiring offset is only the area to be cleared that does not have existing approval for clearing.

On the basis that clearing of 'least concern' REs under the VM Act do not need to be offset, the total area of vegetation requiring offset for the CRM is 258 hectares, of which 145.2 hectares is EPBC-listed.

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<sup>39</sup> Mine commencement date required to be notified by BMA under condition 1(b), Schedule 1, Appendix 1,

**Table 15: Total extent of disturbed REs (based on EIS Table 8.4 and recalculated following SEIS).**

RE	EPBC Act status	VM Act status	Area in CRM site (ha)	Area to be cleared (ha)	Area with existing approval (ha)	Area requiring offset (ha)
11.3.2		of concern	351.8	248.6	140.3	108.3
11.3.25		least concern	75.9	31.5	0	N/A
11.4.2		of concern	4.5	4.5	0	4.5
11.4.8 Brigalow	endangered	endangered	10.1	8.2	0	8.2
11.4.9 Brigalow	endangered	endangered	92.1	15.5	3.1	12.4
11.5.3		least concern	245.5	100.0	0.5	N/A
11.5.9		least concern	259.4	217.3	37.9	N/A
11.8.5		least concern	255.0	25.1	6.8	N/A
11.8.11 Natural grasslands	endangered	of concern	153.1	124.6	0	124.6
11.9.5 Brigalow	endangered	endangered	31.7	3.9	3.9	0
Total <b>not</b> EPBC listed			1192.1	627.0	185.5	112.8
Total EPBC listed			287.0	152.2	7.0	145.2
<b>Total</b>			1479.1	779.2	192.5	<b>258.0</b>

Note: 'Area requiring offset' is the 'area to be cleared' less the 'area with existing approval' for clearing.

The total areas of EECs that are required to be cleared that do not already have existing approval are:

- brigalow — 20.6 hectares
- natural grasslands — 124.6 hectares.

It is arguable that, as the CRM is a newly configured mine proposal and that most other conditions of the previous mine approval are subject to review as part of this new EIS process, then previous approvals to clear vegetation should no longer be exempt from offset requirement calculations. However, **I consider** that it would be inappropriate to retrospectively apply new offset requirements to previous clearing approvals. In reaching this view, **I note** that the quality of the vegetation communities proposed to be cleared is generally poor.

### 6.3.6.2 BMA's biodiversity offset commitments

BMA has committed to develop and implement a biodiversity offset strategy (SEIS Appendix A2) to address the objectives of state and Commonwealth legislation and policy requirements for biodiversity offsets. BMA intends to offset those areas of EEC intended for clearing – and not already subject to the existing surface area approvals for the Peak Downs Mine – with land having ecological values analogous to the impacted EECs.

BMA has committed to develop and implement a biodiversity offset management plan (EIS section 5.4.4; SEIS, Appendix A2) to manage the offsetting of cleared EECs that could not otherwise be avoided or mitigated. This plan provides for the on-ground management and



monitoring of vegetation and wildlife habitats on the offset areas to ensure their long-term ecological viability.

The biodiversity offset management plan proposed in the EIS would include criteria for offset suitability which, where practicable, would include the following elements:

- the acquisition of a remnant/regrowth community that is equal to, or greater in area than that which will be impacted by the mine
- support a comparable suite of plant species contained in RE types impacted by the mine
- consider maximising biodiversity gains through site selection, (e.g. habitat requirements for migratory species that will be impacted by loss of foraging trees and water sources)
- offset locations which are preferentially closer (at least within the locality) to communities impacted by the mine
- offset sites which are preferentially larger contiguous stands of vegetation with connectivity to other habitat types to increase viability of ecological processes
- place potential offset parcels under a secure protection such as a conservation covenant to ensure that protection runs with title
- management measures to ensure offset areas remain viable in the long term. Such measures may include the management of supplementary planting, weed, fire, feral animal, livestock management and restriction on access
- monitoring and maintenance activities to measure success and viability of the offset.

Specific components of the offset management plan will include:

- a map detailing the location and extent of the proposed offset(s), the associated vegetation types and any infrastructure (e.g. fencing, vehicle access networks)
- measures for the long-term management and protection of existing areas of the endangered ecological communities
  - brigalow
  - natural grasslands
- measures to survey and monitor the occurrence of flora and fauna species including but not limited to squatter pigeon (*Geophaps scripta*) and brigalow scaly-foot (*Paradelma orientalis*)
- where appropriate, measures for weed and feral animal control, supplementary fire management, erosion and sediment control, access restriction and livestock exclusion
- the development of a process to review and report on the performance of the management plan and on any unplanned events which may impact on the offset.

BMA has also committed to the following measures at the CRM:

- implement trials to establish brigalow in areas proposed for rehabilitation
- control the extent of buffel grass, parthenium and other weed species in areas currently supporting brigalow and natural grassland EECs.

As part of its initial fulfilment of these commitments, BMA submitted to DIP on 28 April 2010 an initial draft Proposed Biodiversity Offset Strategy – Caval Ridge Mine (CRM Offset Strategy), which was revised on 20 May 2010 and is attached as Appendix 4 of this Coordinator-General's report.

The intent of the proponent for each offset area is that they would be protected under conservation agreements for a nature refuge (NRA). The NRAs would be voluntary agreements between BMA and the Queensland Government that acknowledge a commitment to manage and preserve land with significant conservation values while allowing compatible and sustainable land uses to continue.



### 6.3.6.3 Analysis of offset requirements and draft proposals

As sections 1 and 2 of BMA's CRM Offset Strategy (Appendix 4 of this report) correctly summarise, current Queensland and Commonwealth government vegetation/biodiversity offset policies do not set specific offset ratios, as the ratio requirements vary with the individual circumstances of the particular vegetation to be cleared and the corresponding offsets proposed. Therefore, recent relevant precedents with respect to the application of offset policy inform decisions on this matter.

Clearing of REs classified as 'least concern' under the VM Act is not required to be offset. The requirement I set in the Coordinator-General's Report for the Daunia Mine to offset 'least concern' or 'not of concern' RE's was based on the relatively small areas of vegetation impacted for that mine. Offsetting of cleared least concern vegetation at Daunia was required to increase the offset area to a minimum 20 hectares considered practical for offset management purposes. The requirement set for Daunia should not be considered a precedent for other projects.

In consideration of all parameters associated with the current size, location, ecological integrity, protection status, local/regional significance and connectivity of REs proposed to be cleared for the CRM, I recommend that the following minimum offset ratios apply to the CRM:

- zero offsets for 'least concern' REs
- 1:2 offsets for 'of concern' REs
- 1:3 offsets for 'endangered' REs (and EECs under the EPBC Act).

In light of current offset policies, I further consider that these ratios would need to be increased as the ecological integrity, protection status, contiguity, RE similarity and connectivity of proposed offset decreased and as the distance of the offset from the CRM increased.

On this basis, I **consider** that the minimum offset areas described in Table 16 should apply to the CRM.

**Table 16: Minimum offset areas for the CRM EPBC-listed EECs.**

RE	RE number	EPBC status	Area requiring offset (ha)	Minimum offset required (ha)
Brigalow	11.4.8	endangered	8.2	61.8
	11.4.9	endangered	12.4	
Natural grasslands	11.8.11	endangered	124.6	373.8

I have set further requirements in relation to the offset measures to be taken by BMA for the clearing of 31.5 hectares of *E. tereticornis* / *E. camaldulensis* woodland (RE 11.3.25) on the CRM as the regional biodiversity status of this RE is of more concern than that indicated by the VM act status accorded this RE. I am advised that this is because there is a smaller proportion of this RE remaining in this bioregion than for the state of Queensland as a whole. The offset requirements for RE 11.3.25 are described in section 5.5 of this report as they are outside the scope of MNES considerations or the controlling provisions for the CRM under the EPBC Act.

Although BMA's offset proposals outlined in Appendix 4 are draft and still subject to DERM and DEWHA approval, I make the following observations:

- With respect to the proposed natural grasslands offset at Gregory Crinum:
  - the quality of the grassland there requires further assessment
  - Figure 1 of Appendix 4 appears to indicate that the offset EECs are present in several small separated pockets spread over an area of greater than 10,000 hectares



- the nature and condition of the land between and around the grassland areas are not specified and BMA's intentions with respect to the management of these areas and the grasslands have not been specified
- opportunities exist to rehabilitate connectivity between fragmented remnants where practicable
- the area includes 4.87 hectares of endangered RE 11.3.21 (*Dicanthium* and/or *Astrebla* species grassland REs) and 396.37 hectares comprising mixed REs of which only 80 per cent is the equivalent of the RE 11.8.11 proposed to be cleared for the CRM. That is, 317.1 hectares of RE 11.8.11 is within the mixed REs.
- discounting the proportions of the proposed offset that are not natural grassland REs (i.e. within the mixed REs), the total area of natural grassland available there is only 346 hectares, which may not be sufficient to achieve the minimum offset area for this EEC to a ratio of 1:3 specified in Table 16
- the ownership and tenure arrangements are unclear
- on the basis of these points, **I consider** the proposed offset appears to be inadequate without further augmentation.
- With respect to the proposed brigalow offset at Norwich Park:
  - the offset relies entirely on regrowth brigalow rather than remnant
  - the proposed offset area which has not yet been gazetted as a nature refuge has been designed as an 'offset bank' to acquit vegetation offset obligations of BMA-owned projects. It covers a total of 712 hectares that contains both remnant and regrowth vegetation, including approximately 350 hectares of brigalow dominated regrowth and approximately 150 hectares of mixed brigalow, Dawson gum and poplar box regrowth
  - the land is owned by CQCA and is managed by BMA, although non BMA entities hold a coal exploration permit and an authority to prospect for petroleum over the area
  - as the proposed offset ratio is approaching 1:5 and the range of ecological values for this refuge appear to be high, **I consider** this proposal to be acceptable.

#### 6.3.6.4 Uncertainty about other resource tenures over offset areas

There is potential for the tenure of the proposed offset lands to be subject to future applications for development under the Mineral Resources Act 1989 and the Petroleum and Gas (Production and Safety) Act 2004, hence affecting their protection status for vegetation offsets.

A vegetation offset would normally be expected to have protection from development in a way which would see the area managed sustainably for an indefinite period. It is desirable that a conservation agreement for a nature refuge be obtained over the offset lands, as this would provide some protection from development other than mining or petroleum development. However, due to the prior existence of resource tenures over the land, NRAs cannot be relied upon to deliver absolute security for the proposed offset lands.

**I note** that it may be some years before the fate of the proposed CRM offset lands become known, so I do not require the proponent to secure alternative lands at this time. Instead, **I require** the proponent to find a satisfactory alternative, if any of a future secured CRM offset area is cleared, or should BMA relinquish management of the offset. The alternative could be either the provision of another offset area, or an equitable monetary contribution to Ecofund Queensland's Trust or other offset broker that could be used to purchase land to be added to the protected estate. Payments for any on-going management costs for an alternative offset would also have to be made until the offset attained its remnant status.

**I also note** that should the CRM offset lands be proposed to be cleared in the future by the holder of the underlying mining or petroleum tenures, then those tenure holders would also be required to provide additional offsets for that particular clearing.

### 6.3.7 Coordinator-General's conclusions and conditions

**I accept** that the vegetation communities on the CRM site are highly modified and in poor condition, and are subject to high levels of weed incursion.

**I accept** that no EPBC-listed threatened flora species are present on the CRM site.

I accept the EIS conclusion that none of the six EPBC-listed threatened fauna species are likely to suffer significant adverse impacts as a result of the proposed action.

**I acknowledge** the commitment by BMA to undertake additional and ongoing management activity to mitigate impacts to MNES. To confirm these commitments **I have imposed** Conditions 3(b)-(d) that require BMA to provide DEWHA and DERM a 'Threatened Flora and Fauna Species and Ecological Communities Management Plan' that:

- ensures the impacts to these species and communities are minimised
- contributes to the survival of these species in the wild, and
- achieves conservation benefits for these species and communities where practicable.

That Plan must include management measures addressing the threatened species listed in the 'controlling provisions' for the CRM under the EPBC Act.

**I note** that DEWHA may also seek to review the further development of these commitments.

Based on the findings of the EIS, I conclude that it is unlikely significant impacts on the EPBC-listed threatened species will occur, and that the mitigation measures proposed by BMA for the CRM will be adequate to minimise potential adverse impacts to those listed threatened species to an acceptable level.

**I note** the Commonwealth Government may also set its own requirements with respect to potential impacts to EPBC-listed threatened species and communities that occur on the CRM site.

**I am satisfied** that BMA has provided sufficient and accurate information on the classification and extent of vegetation that had been approved for clearing prior to July 2000, and that this information is sufficient to provide a basis for calculating appropriate offsets.

**I consider** that the combined strategies put forward in the EIS, SEIS, draft EM Plan and proposed in this Coordinator-General's report (subject to finalisation and approval by relevant agencies), which include offsetting of cleared EECs, and ongoing management of threatening processes within offset areas and retained habitats, are adequate to offset and/or manage the potential adverse impacts of the CRM on those MNES for which the BBCG project is declared a controlled action.

**I acknowledge** the commitment by BMA to prepare and implement a Biodiversity Offset Strategy (Appendix 4 of this report), in consultation with relevant agencies, to address the requirements of state and Commonwealth legislation and policies for offsets. While Condition 3(a), Schedule 1, Appendix 1 requires the final approval of the Biodiversity Offset Strategy by DERM and DEWHA, **I recommend** (Recommendation 5, Schedule 5, Appendix 1) with respect to the proposals in Appendix 4 that:

- the general scope of the offset proposal for brigalow at Norwich Park is acceptable
- subject to the provision of more detailed information, the offset proposal for natural grasslands at Gregory Crinum appears to be insufficient for EPBC-listed ECCs without further augmentation
- to avoid the risk of double-counting, BMA delineates and quantifies in the Biodiversity Offset Strategy the areas of vegetation in each proposed offset area attributable to each phase of the BBCG project
- DEWHA and DERM decision makers on the Biodiversity Offset Strategy for the CRM note my comments in sections 6.3.6.3 and 6.3.6.4 of this report in relation to BMA's offset proposals.



**I state** that nothing within the conditions that I have set limits the Commonwealth Government from providing conditions regarding MNES under the EPBC Act.

## 7. Environmental management plan

An environmental management plan (EM plan) is required under section 201 of the EP Act as part of an application for an environmental authority (EA) for a mining lease.

Section 202 of the EP Act states that the purpose of an EM plan is to propose environmental protection commitments to assist the administering authority to prepare the draft EA. As such, the EM plan proposes environmental management strategies, actions and procedures to be implemented during the construction and operation of the mine in order to mitigate adverse and enhance beneficial environmental and social impacts.

In accordance with section 203 of the EP Act, an EM plan must contain the following sections:

- section 1—provides a description of all elements of the CRM proposal including the relevant mining leases and land tenures; describes potential adverse and beneficial impacts on the environmental values likely to be affected by mining activities; and states any code of environmental compliance environmental protection commitments and any other information to allow the administering authority of the EP Act (DERM) to decide the application and conditions to be imposed on the EA.
- section 2—outlines how the environmental protection commitments and objectives are to be measured and audited, and includes control strategies to ensure the objectives are achieved.
- section 3—states the rehabilitation objectives and identifies rehabilitation indicators against the environmental protection objectives described in section 2.
- section 4—states that the indicators described in section 3 may vary for different parts of the land that have different types of disturbance.

Chapter 21 and Appendix Q of the EIS presented a draft EM plan for the CRM. The EM plan was refined by BMA based on submissions received during the EIS comment period, and this revised version was presented as Appendix O of the SEIS. The EM plan will be further refined and expanded following the finalisation of this report, during the detailed design phase of the CRM and through ongoing consultation with the relevant advisory agencies.

The environmental studies and consultation conducted as part of the impact assessment process have identified the potential construction and operation impacts of proceeding with the CRM. In effect, the EM plan becomes the key reference document that converts the undertakings and recommendations of the environmental studies into actions and commitments to be followed by the designers, constructors and future operators of the proposed CRM.

The CRM EM plan contains provisions for the following key issues:

- air quality
- water resources
- noise and vibration
- waste management
- land management
- landscape character and visual amenity
- terrestrial ecology
- cultural heritage
- traffic
- community.

For each key issue, the structure of the EM plan provides:



- background information
- environmental value
- potential impacts on the environmental value
- environmental protection objectives
- performance criteria
- commitments
- proposed EA conditions.

In addition, the CRM EM plan provides EA conditions for general issues that do not relate to environmental values or control strategies e.g. for financial assurance; maintenance of plant and equipment; monitoring; storage and handling of flammable and combustible liquids; definitions; and notification of emergencies, incidents and exceptions.

BMA has committed to implement all commitments made during the EIS process and the EM plan through an environmental management system (EMS) prepared in accordance with ISO 14001 that would be subject to periodic third-party audit.

It is proposed that a contractor's construction EM plan will address potential impacts during the construction phase, and a site EM plan will address impacts during operation and decommissioning.

The effective implementation of the EM plan will satisfy the commitments made by BMA in the EIS, the SEIS, and in correspondence with members of the public and advisory agencies, and will ensure the effective management of environmental impacts of the CRM.

Environmental outcomes are achieved by specifying the monitoring, reporting and auditing requirements, with nominated responsibilities and timing, to ensure that the commitments are met. The EM plan also identifies corrective actions if monitoring indicates that the performance requirements have not been met.

**I note** that the commitments made by BMA during the EIS process are included in the structure of the CRM EM plan.

The EP Act and the conditions that **I state** in consultation with DERM in Schedule 3, Appendix 1 of this report require the EM plan to be periodically reviewed and revised in response to monitoring, incident investigations, audits, technological and process improvement, and the outcomes of further agency and community consultation.

## 8. Conclusion

Having regard to the documentation provided during the EIS process for the Caval Ridge Mine (CRM) component of the Bowen Basin Coal Growth (BBCG) project, **I am satisfied** that the requirements of the Queensland Government for impact assessment in accordance with the provisions of part 4 of the SDPWO Act have been met.

The EIS process has provided sufficient information to the Queensland Government and the community to allow evaluation of potential environmental, social and economic impacts that could be attributed to the CRM.

**I am satisfied** that careful management of the key construction and operation activities of the mine, and adoption of any proposed additional items that **I have recommended** should ensure that potential environmental impacts will be minimised or avoided.

BMA has made commitments through the EIS process (EIS, Appendix S) and, during the subsequent review of the EIS, has made additional commitments in response to issues raised (SEIS, Appendix P). Many of these commitments have been included as conditions for the CRM while others are to be included in the Environmental Management (EM) plan.

The draft EM plan (EIS section 21 and Appendix Q, and SEIS Appendix O) that BMA has developed is required under the EP Act as part of an application for an environmental authority (EA) for a mining lease, to address specific environmental matters identified during the EIS process associated with the construction and operation of a mine. The draft EM plan will be further refined and expanded following the finalisation of this report, during the detailed design phase of the CRM and through ongoing consultation with the relevant advisory agencies.

In reaching a conclusion on the acceptability or otherwise of the management of potential impacts of the CRM, **I have considered** these commitments and the EM plan.

Where necessary, **I have stated and imposed conditions and made recommendations** on environmental, social and economic issues that BMA and other relevant entities are to implement.

On the basis of the information provided, including that from advisory agencies, **I am satisfied** that the environmental, social and economic impacts associated with the CRM are able to be addressed through:

- implementation of conditions **I have stated** on the EA in consultation with DERM in Schedule 3, Appendix 1 of this report, under the EP Act for construction and operation works associated with the mine
- implementation of conditions listed in Schedule 1, Appendix 1 of this report, **I have imposed** for aspects of the CRM that are not the subject of the EA
- obtaining all other relevant necessary statutory approvals, licences and permits as required subject to conditions **I have recommended** in Schedule 4, Appendix 1 of this report
- implementation of the **other recommendations I have made** in Schedule 5, Appendix 1 of this report
- obtaining a development approval and registration certificate from DERM under the EP Act for any ERAs not located on the mining lease.

**I consider** that, on balance, the proposed CRM would provide a net social and economic benefit to the Moranbah and Isaac Regional communities, the Central Queensland region, and the State of Queensland.

Therefore, pursuant to section 35 of the SDPWO Act, **I recommend** that the CRM component of the BBCG project, as described in detail in the EIS, the SEIS, technical reports included as



Appendices 2–4 of this report, and summarised in section 2 of this report, can proceed, subject to the conditions contained in Appendix 1 of this report and the commitments made by BMA (Appendix S of the EIS and Appendix P of the SEIS).

In the event of any inconsistencies between the EIS documents and the recommended requirements in this report, the recommended requirements in this report prevail.

BMA and its agents must implement the conditions and recommendations of this report and all commitments presented in the EIS, SEIS and EM plans.

In accordance with section 17(2) of the SDPWO Regulation, a copy of this report will be provided to the Commonwealth Minister for the Environment, Heritage and the Arts to enable a decision to be made under part 9 of the EPBC Act.

Under the provisions of part 9 of the EPBC Act, the Commonwealth Minister may approve or refuse the taking of the proposed action. In approving a proposed action, the Commonwealth Minister may attach conditions to the approval if he is satisfied that the condition is necessary or convenient to protect a matter of national environmental significance, or to repair or mitigate damage to a matter of national environmental significance.

Copies of this report will be issued to BMA, in accordance with section 35(5)(a) of the SDPWO Act.

Copies of the report will be also issued to agencies responsible for implementation of conditions including:

- DERM
- DEEDI
- TMR
- Office of Economic and Statistical Research in Queensland Treasury
- IRC.

Other advisory agencies who participated in the EIS process will be notified about the availability of this report.

In accordance with section 35(5)(b) of the SDPWO Act, a copy of this report will be made available to the public on DIP's website at:

<http://www.dip.qld.gov.au/projects/mining-and-mineral-processing/coal/bma-bowen-basin-coal-growth.html>