

Red Hill Mining Lease

Initial Advice Statement

May 2013



BHP Billiton Mitsubishi Alliance

BMA Red Hill Mining Lease

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Executive Summary

The Red Hill Mining Lease is located adjacent to the existing Goonyella Riverside and Broadmeadow (GRB) mine complex in the Bowen Basin, approximately 20 kilometres north of Moranbah and 220 kilometres south-west by road from Mackay, Queensland.

BHP Billiton Mitsubishi Alliance (BMA), through its joint venture manager, BM Alliance Coal Operations Pty Ltd, proposes to convert the existing Red Hill Mining Lease Application (MLA 70421) to enable the continuation of existing mining operations associated with the GRB complex. Specifically, the mining lease conversion will allow for:

- An extension of three longwall panels (14, 15 and 16) of the existing Broadmeadow underground mine (BRM).
- A future incremental expansion option of the existing Goonyella Riverside Mine (GRM).
- A future Red Hill Mine (RHM) underground expansion option located to the east of the GRM complex which includes development of key infrastructure as detailed in Section 3.

The 3 project elements described above are collectively referred to as '*the Project*'.

This Initial Advice Statement (IAS) has been drafted to provide the Queensland Coordinator-General with sufficient information to make a determination under the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act), to declare *the Project* to be a '*coordinated project*'. BMA recommends that *the Project* is suitable to be declared due to the potential strategic value of *the Project* to contribute towards future employment, economic growth and future government revenue. Other attributes of *the Project*, such as the complexity of the assessment to be undertaken and approvals required from State and Commonwealth authorities, also indicate the suitability for project declaration under the SDPWO Act.

The Project has been referred to the Commonwealth Minister for Sustainability Environment Water Population and Communities (SEWPaC) in anticipation that the proposal will be deemed a '*controlled action*', under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). If determined to be a controlled action, BMA will seek assessment of *the Project* in accordance with the Bilateral Agreement between the Australian Government and the State of Queensland. The added complexity of requiring Commonwealth, as well as State approvals, would best be administered through the Coordinator-General's EIS assessment process.

The conversion of the Red Hill Mining Lease is of strategic importance to the planning and development of existing operations within and around the existing GRB complex. It is anticipated that development work for mining of panels 14, 15 and 16 associated with the BRM will commence in Financial Year (FY) 2016. The mining of these extensions will utilise existing mine infrastructure and extend the Life of Mine (LoM) by approximately 1 year.

The timing for commencement, the rate of development and scale of future production for the RHM underground expansion option has not been determined and is subject to the owner's approvals. At full production, the expansion option has the potential to produce up to 14 million tonnes per annum (mtpa) of high quality hard coking coal over a life of 20 – 25 years. Under this scenario, the potential capacity of the extended complex (GRB and RHM) would be up to approximately 32mtpa.

The conversion of the mining lease has the potential to result in:

1. The extension of 3 longwall panels (14, 15 and 16) of the existing Broadmeadow underground mine (BRM) resulting in the potential for:
 - An extended Life of Mine (LOM) for Broadmeadow Operations by approximately 1 year and the potential for additional government royalties.
 - Gaining access to approximately 5 million Run of mine (ROM) tonnes of high quality hard coking coal and avoiding potential sterilisation of a valuable resource.

- Improved operational efficiencies with BRM creating the potential for increased government royalties.
2. The strategic development and future incremental expansion option of the existing GRM with positive benefits including:
- Increased mine production efficiency creating the potential for increased government royalties.
 - Shorter lead times for developing new production operations in response to improved market conditions creating the potential for increased government royalties.
 - Longer lead times for pre-drainage of incidental gas. Benefits include improved project feasibility due to decreased development costs and the potential for more effective management of environmental impacts and potential beneficial re-use of incidental gas.
3. A future RHM underground expansion option located to the east of the GRM complex which has the potential to:
- Contribute significantly to the State's economy and provide employment opportunities.
 - Employ up to 2,000 people during the peak construction phase and up to 1,500 people (likely to be a remote workforce) during the peak operation phase. In addition to the direct construction and operation workforce, there is potential for local employment opportunities in transport and the supply of goods and services.
 - Require future capital investment to bring it to full production and projected further expenditure for replacement and maintenance of capital equipment and infrastructure over the life of operations.
 - Generate future coal sales and exports over the life of the operation, and associated future potential revenue benefits for the State and Commonwealth through coal royalties and other taxation.
 - Increase the potential for industrial activity in the region and generate wealth for many sectors of the local and regional economies. Moranbah and surrounding regional communities have the potential to benefit significantly due to the potential economic benefits.
 - Provide efficiencies by capitalising on the proximity to existing infrastructure and the positioning of new infrastructure located at BMA's GRB Mine Complex.
 - This includes the potential for:
 - A new Mine Infrastructure Area (MIA).
 - A new Red Hill Coal Handling and Preparation Plant (CHPP) adjacent to the existing Riverside MIA. To service the full production potential of RHM, the Red Hill CHPP would consist of up to three 1,200 tonne per hour (tph) modules.
 - A conveyor system linking RHM to the Red Hill CHPP.
 - Associated coal handling infrastructure and stockpiles.
 - A conveyor linking coal stockpiles to a rail load out facility.

The key environmental and social aspects of *the Project* are as follows:

- *The Project* may impact on threatened ecological communities and species listed under the *EPBC Act*. A referral has been made to the Commonwealth for a determination of whether *the Project* is a 'controlled' action or not.
- Changes in final landform due to subsidence is likely to occur.
- The management of groundwater during pre-drainage of incidental mine gas (IMG), progressive underground mine dewatering and disturbance to strata around mining areas.

- The management of potential for impacts on ecological communities and species listed under nature conservation legislation, which may be disturbed as a result of subsidence and surface infrastructure.
- Stabilising and rehabilitation of disturbed land to a suitable post mine land use.
- Surface disturbance for gas drainage including a network of bores and associated gas pipelines.

The RHM underground expansion option may also have additional key environmental and social aspects as follows:

- Surface disturbance for mine infrastructure including roads, the CHPP, conveyors, workforce accommodation village and MIA.
- The management of the Isaac River and its tributaries, 12 Mile Gully, Goonyella Creek and Eureka Creek. Sections of these watercourses traverse the underground mine footprint and they may be impacted upon due to subsidence resulting from underground longwall operations.
- Influence on the region's demographics and population through increased direct and indirect regional employment. Minimal impacts to the existing local socio-economic environment in relation to housing, employment, community values and the availability and development of public services as an up to 100 per cent remote workforce accommodated on lease at the mine site is proposed.

The Project will require inter-departmental coordination for permitting and approvals to effectively manage the assessment process. *The Project* requires an application for a new Mining Lease (MLA 70421) and an approved Environmental Authority authorised under the Environmental Protection Act 1994 (EP Act). There is no off-lease work proposed for *the Project*, therefore the only activities pursuant to the *Sustainable Planning Act 2009* are the building works approvals and potential road and intersection upgrades associated with the RHM underground expansion option, which will be undertaken in consultation and collaboration with Isaac Regional Council and relevant state government departments

An indicative list of potential approvals for *the Project* is presented in **Table 10** of this IAS.

The Proponent

BMA was formed in 2001 as a 50:50 unincorporated joint venture between BHP Billiton and Mitsubishi Corporation. The joint venture is known as the Central Queensland Coal Associates (CQCA) Joint Venture. BM Alliance Coal Operations Pty Ltd operates as the duly appointed constituted attorney for the Central Queensland Coal Associates Joint Venture Agreement and a Strategic Alliance Agreement dated 28 June 2001.

The operational mines are Blackwater, Broadmeadow, Goonyella Riverside, Peak Downs, Saraji, and Crinum. The Norwich Park and Gregory Open Cut Mines ceased production in May and October 2012 respectively, and remain in care and maintenance. BMA also owns and operates the Hay Point coal export terminal near Mackay.

BMA's six operational mines have a combined production capacity of around 50 mtpa. An additional two BMA mines are currently under construction, namely Daunia (4.5 mtpa) and Caval Ridge (5.5 mtpa). These mines will be operational in 2013 and 2014 respectively.

BMA supplies high quality coking coals, pulverized coal injection coals and thermal coals to domestic and international customers.

BMA is committed to the communities in which it operates. In 2012, BMA invested around \$38 million across the Bowen Basin townships to support local services and community development programs.

1 Introduction

1.1 Project background

The Red Hill Mining Lease is located adjacent to the existing GRB mine complex in the Bowen Basin, approximately 20 kilometres north of Moranbah and 135 kilometres south-west of Mackay, Queensland. The regional context is shown in **Figure 1**.

BMA proposes to convert the existing Red Hill Mining Lease Application (MLA 70421) to enable the continuation of existing mining operations associated with the existing GRB complex.

Specifically, the mining lease conversion will allow for:

- An extension of three longwall panels (14, 15 and 16) of the existing Broadmeadow underground mine (BRM).
- A future incremental expansion option of the existing GRM.
- A future RHM underground expansion option located to the east of the GRM complex which includes development of key infrastructure.

The 3 project elements described above are collectively referred to as '*the Project*'.

The mining of the BRM panel extensions (14, 15 and 16) will utilise existing mine infrastructure and extend the Life of Mine (LoM) by approximately 1 year. No additional mining infrastructure is required to enable the extensions into MLA 70421. The existing BRM workforce will complete all work associated with the extensions.

The RHM underground expansion option has the potential to produce up to 14 million tonnes per annum (mtpa) of high quality hard coking coal over a life of 20 – 25 years. While the proposed future development will be operated as an independent mine in terms of workforce, the proposed mine will interface with the existing GRB mine complex in the following areas:

- Water for processing coal will be sourced from the GRB mine complex and mine water generated from the mine will be transferred to the GRB mine water management network. This interface will provide greater efficiency, maximise reuse, ensure mine water releases are managed holistically and reduce water related risks.
- MIA, CHPP, conveyors and stockpiles will be co-located with the existing Riverside Mine coal handling facilities.
- Waste from coal processing will be dewatered and disposed of in in-pit spoil.

For the purpose of the IAS, the project site is defined by the area of land within part of ML 1763 and part of mining lease application (MLA) 70421, to the east of GRB mine complex.

Components of *the Project* will be located within the GRB mine complex MLs and include but are not limited to the proposed Coal Handling and Preparation Plant (CHPP), Mine Infrastructure Area (MIA), water, mineral waste and power supply infrastructure. This is discussed further in Section 3.1.

The key objectives of *the Project* are to:

- Utilise BMA owned land on the GRB Complex Mining Leases (MLs) to minimise the environmental impacts from additional infrastructure and to provide project efficiencies.
- Maximise resource recovery and sustain existing operations.
- Operate a profitable project to provide high-quality hard coking coal to the export market.
- Design, construct and operate a project that:

- minimises adverse impacts on the social environment;
- complies with all relevant statutory obligations and continues to improve processes, which enhance sound environmental management.

1.2 Purpose and scope of the IAS

This IAS has been prepared by BMA to provide information to:

- enable the Coordinator-General to determine a declaration of *the Project* as a ‘Coordinated Project’ under the *SDPWO Act*;
- inform preparation of a terms of reference for an Environmental Impact Statement (EIS);
- inform stakeholders and the general public.

The scope of *the Project* IAS encompasses a range of aspects associated with *the Project* and provides information on:

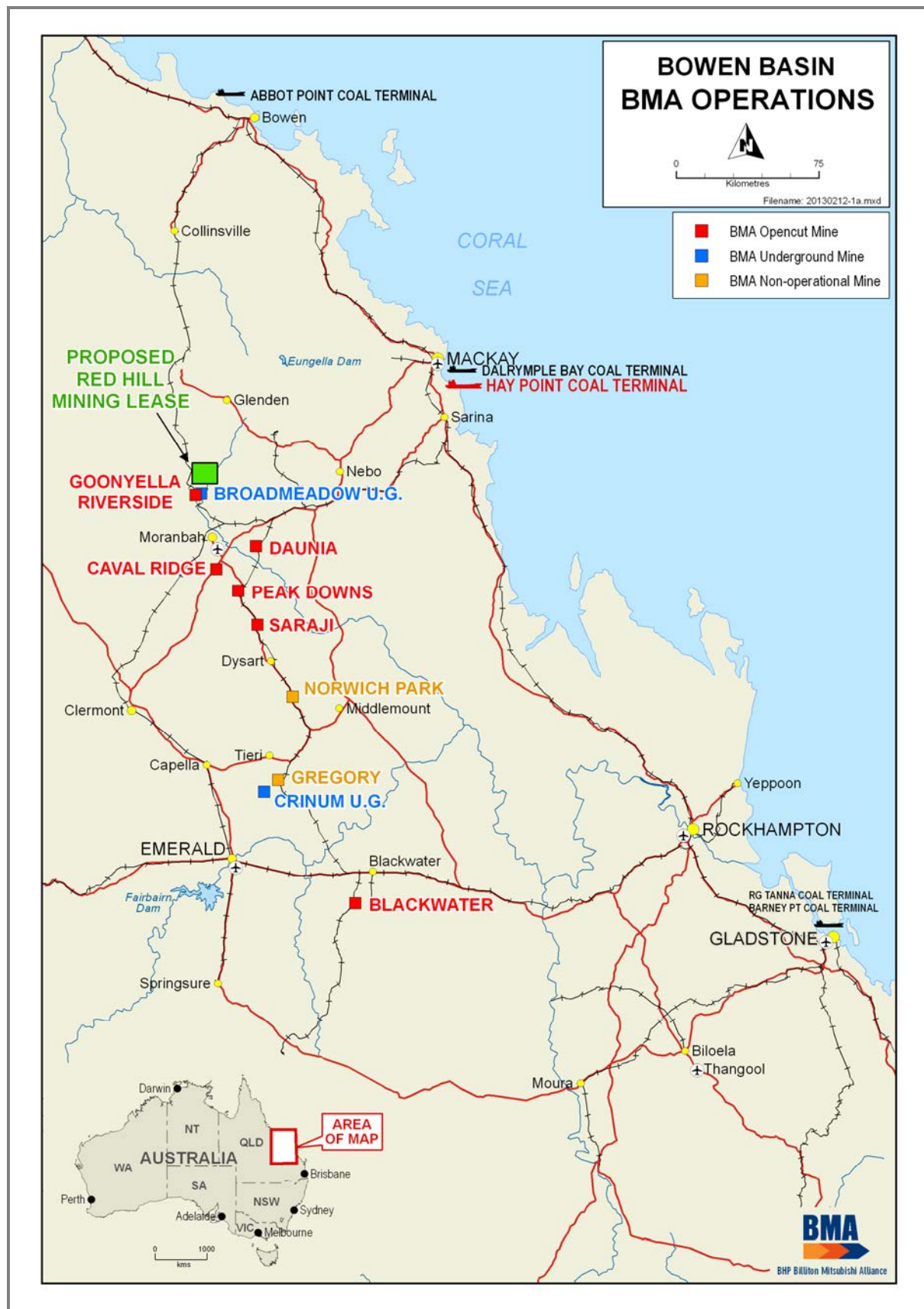
- the Proponent;
- the purpose and proposed operations;
- the costs and benefits;
- existing environmental factors;
- potential environmental impacts;
- any identified measures for environmental management and mitigation.

BMA recommends that *the Project* is suitable to be declared due to the potential strategic value of *the Project* to contribute towards future employment, economic growth and future government revenue. Other attributes of *the Project*, such as the complexity of the assessment to be undertaken and approvals required from State and Commonwealth authorities, also indicate the suitability for project declaration under the *SDPWO Act*.

While BMA has access to a number of existing and prospective coal resources in the Bowen Basin, the Red Hill Mining Lease resource has been identified for future development on the basis that:

- Broadmeadow Operations panels are to extend into MLA 70421. High quality product coking coal exists within the proposed panel extensions. Without the statutory approvals and conversion of tenure, mining cannot commence or extend across into MLA 70421.
- The resource is a high quality resource that will meet future market demand.
- The extent and nature of the resource is quite well understood due to extensive exploration and hence BMA can bring this project into production reasonably quickly compared to less well known resources.
- Concurrent mining of different quality coals from the adjacent mines provides a high level of flexibility in terms of product mixes which is not readily achievable where mines are located further away.
- The resource is adjacent to an existing operation, being the GRB mine complex. This provides a number of synergies in terms of water management, water and power supply, ability to share rejects and mine waste disposal facilities and ability to share rail infrastructure, particularly rail loops.

Figure 1 - Regional Context



2 The Proponent

BMA was formed in 2001 as a 50:50 unincorporated joint venture between BHP Billiton and Mitsubishi Corporation. The joint venture is known as the Central Queensland Coal Associates (CQCA) Joint Venture. BM Alliance Coal Operations Pty Ltd operates as the duly appointed constituted attorney for the Central Queensland Coal Associates Joint Venture Agreement and a Strategic Alliance Agreement dated 28 June 2001.

BMA has equal ownership and management of six Central Queensland operational coal mines: Blackwater, Broadmeadow, Goonyella Riverside, Peak Downs, Saraji, and Crinum underground and also manages the Hay Point Coal Terminal near Mackay in Queensland.

An additional two mines are currently under construction, namely Daunia and Caval Ridge. The Norwich Park and Gregory Crinum open cut mines ceased operation in May and October 2012 respectively, and remain in care and maintenance. The locations of BMA's assets are shown in **Figure 1**.

BMA's operations provide significant benefits to the local communities, the broader Central Queensland region and to the Queensland economy as a whole. BMA is the largest employer in the region with approximately 10,000 full time equivalent employees and contractors and plays a key role in the economic development of Central Queensland.

BMA's contribution during the 2012 financial year included:

- \$1,847 million spent on equipment, goods and services from Central Queensland regional businesses;
- over \$2,724 million spent on equipment, goods and services from other Queensland businesses;
- \$1,472 million spent on equipment, goods and services from other Australian businesses;
- over \$38.186 million spent in Central Queensland townships and communities;
- \$955 million in wages and salaries to employees;
- approximately \$200 million accommodating our workforce in the Bowen Basin;
- \$911 million paid in coal royalties to the Queensland Government.

BMA is committed to the communities in which it operates. In 2012, BMA invested around \$38 million across the Bowen Basin townships to support local services and community development programs. In Moranbah, BMA's financial contribution alone was approximately \$15 million, and included:

- \$1.4 million for a range of company community support programs such as day care, additional sporting and recreational facilities, education and cultural initiatives;
- \$13.3 million (including \$4.6M towards special rates and charges) for local infrastructure support for water, road and airport maintenance. BMA supplies and funds more than 80 per cent of Moranbah's water including \$7.9m in-kind water supply to Moranbah during FY12.

Previous commitments from BMA include the 2011 Moranbah Community Support Package and airport upgrade.

The Moranbah Community Support package included:

- \$5.5 million towards the development of a Regional Youth and Community Services Centre;
- \$2.5 million to assist with the redevelopment of the Greg Cruickshank Aquatic Centre;

- \$5 million over five years to assist with the provision of affordable accommodation for low income non-resource sector service workers.

In addition to the Moranbah Community Support Package, BMA has committed \$46 million towards the upgrade of the Moranbah airport to put services for Moranbah on par with other regional centres. The Airport Upgrade was officially opened by the Deputy Premier of Queensland, the Hon Jeff Seeney MP on 21 March 2013.

BMA is committed to regularly reviewing environmental performance and publicly reporting on progress and health, safety, environment and community performance. BMA has an excellent record of responsible environmental management and a strong commitment to continual improvement of environmental performance.

All existing BMA mine sites operate under an ISO14001 certified Environmental Management System.

BHP Billiton also has an overriding commitment to environmental responsibility and strives to achieve the efficient use of resources, including reducing and preventing pollution, and enhancing biodiversity protection by assessing ecological values and land use in our activities. A stewardship approach is designed to ensure that the lifecycle health, safety, environment and community impacts associated with resources, materials, processes and products related to the businesses are minimised and managed.

The following consultants have been engaged to undertake technical studies for the EIS on behalf of the Proponent:

Table 1 - EIS Consultant Team

Consultant	Technical Assessment & Reporting
URS (Lead consultant)	Land Use and tenure Contamination Mineral Waste Flood Hydrology Flood Hydraulics Subsidence Hydrology Surface Water Quality Groundwater Terrestrial Ecology Aquatic Ecology Waste Management Health Safety and Risk Cumulative Impacts
SKM	Water Balance Modelling
Advanced Environmental Dynamics Pty Ltd	Air Quality, Greenhouse Gases, Climate
Corkery Consulting	Visual Assessment
Elliot Whiteing Social Planning Consultants	Social Impact Assessment
Alluvium	Geomorphology
PWC	Economics
Cardno	Traffic Impact Assessment
Converge	Non-indigenous Cultural Heritage

3 The nature of the proposal

3.1 Scope of the Project

3.1.1 Project development

The Project will consist of the following key components:

- Extension of BRM longwall panels, 14 15, and 16, into MLA 70421. The existing GRB mine complex Environmental Authority (EA) will be amended to accommodate this change.
- A future incremental expansion option of the existing GRM.
- A future RHM underground mine expansion option located to the east of the GRM complex, to target the Goonyella Middle Seam (GMS). The mine layout consists of a main drive extending approximately west to east with longwall panels ranging to the north and south.

3.1.2 Project infrastructure

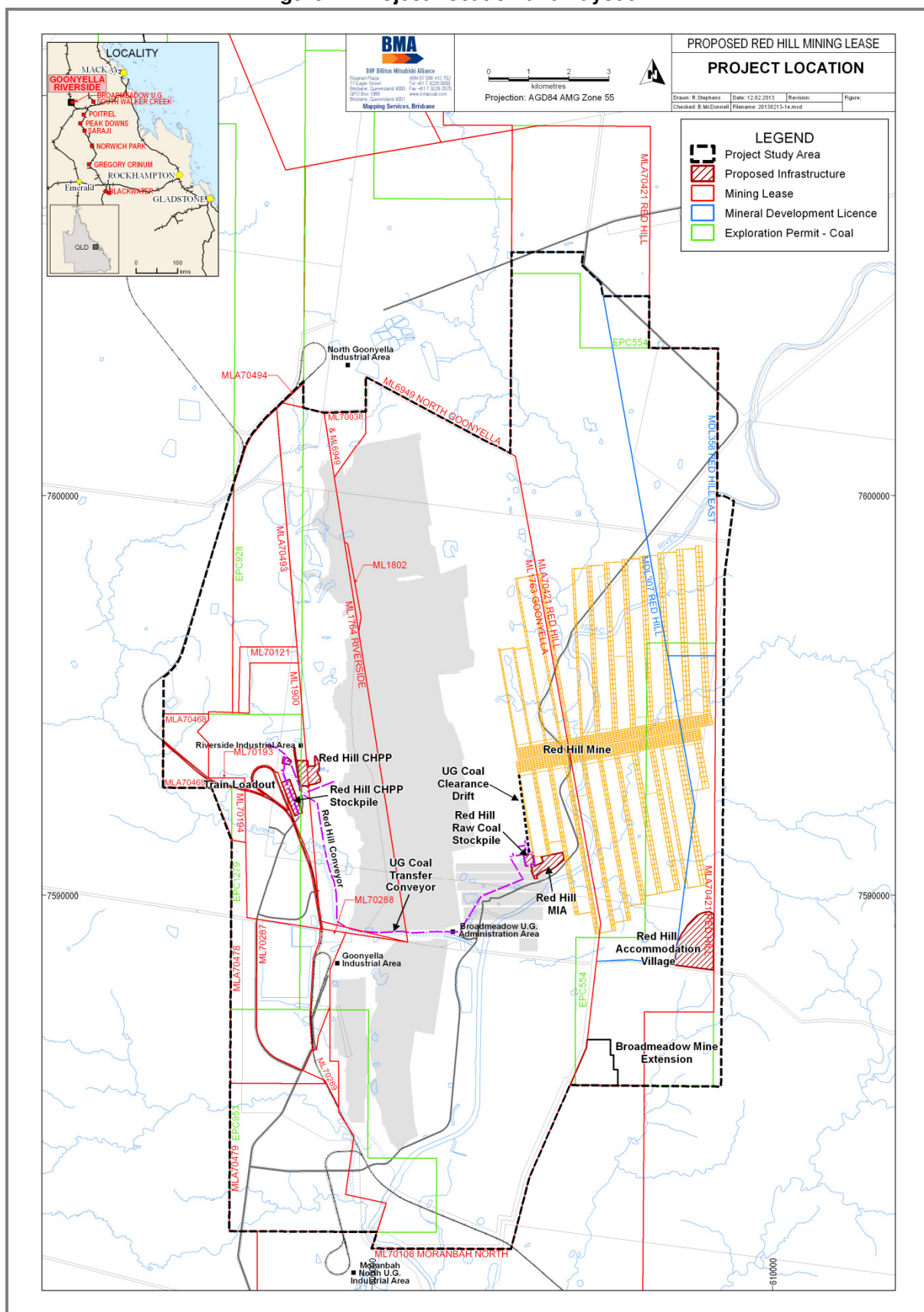
The extension of the existing BRM into MLA70421 is to sustain existing production rates of the mine. This will be completed by the existing BRM workforce. No new infrastructure is proposed. The potential environmental impacts associated with the extension will be presented in the EIS and the activity will integrate with the existing GRB mine complex EA.

The potential key infrastructure requirements for the RHM underground expansion option are:

- A CHPP adjacent to the Riverside MIA – the Red Hill CHPP will consist of up to three 1,200 tonne per hour (tph) modules.
- A conveyor system linking RHM to the new MIA and then to the Red Hill CHPP.
- Associated coal handling infrastructure and stockpiles.
- A new conveyor linking product coal stockpiles to the existing rail load-out facility.
- Pipeline connections to the existing GRB mine complex site water management network to allow transfers of mine water to and from RHM.
- 66 kV power connection from the existing infrastructure within the GRB mine complex to the Red Hill CHPP and related infrastructure.
- Relocation and tie-in to 66 kV infrastructure.
- Associated IMG pipeline gathering, control, monitoring and flare infrastructure and a bridge across the Isaac River for all-weather access. This will be located above the main headings, and will provide a crossing point for other mine related infrastructure including water pipelines and power supply.
- Means for providing flood protection to the mine access and MIA, potentially requiring a levee along the west bank of the Isaac River.

A current indication of the proposed locations of the key proposed infrastructure are shown in **Figure 2**.

Figure 2 - Project Location and Layout



3.1.3 Accommodation and workforce

The BRM panel extensions will not require the construction of additional infrastructure and will be operated by the existing BRM workforce.

For the RHM underground expansion option, BMA will contract the construction of the CHPP, MIA, drift and supporting infrastructure, plant and equipment including buildings, conveyors and roads to a suitable construction contractor(s). The Operational phase of the expansion option will be owned and operated by BMA.

The RHM underground expansion option has the potential to employ up to 2,000 construction employees and up to 1,500 operational employees at full production. A proposed new accommodation village (Red Hill accommodation village) for the construction and operational remote workforces has the potential to accommodate up to 3,000 workers. The location of the proposed on lease accommodation village is shown in **Figure 2**.

The ultimate capacity of the accommodation village will be determined by the rate and scale of future development sanctioned by the owners. The 3000 person village capacity accounts for a peak workforce arising out of a potential overlap between construction and operations.

The estimated workforce numbers presume a Greenfield expansion option is undertaken and do not account for potential synergies with existing operations.

3.1.4 Gas drainage and management

Preliminary assessments indicate that certain areas within the target GMS (and adjacent overlying and underlying seams) have a high gas content (primarily composed of methane gas). As the gas is not the primary target of the mining activity, it is referred to as Incidental Mine Gas (IMG).

The gas is confined in the coal seam by inter-bedded relatively impermeable rock formations and water pressure, but once the coal seam is mined, gas can be released.

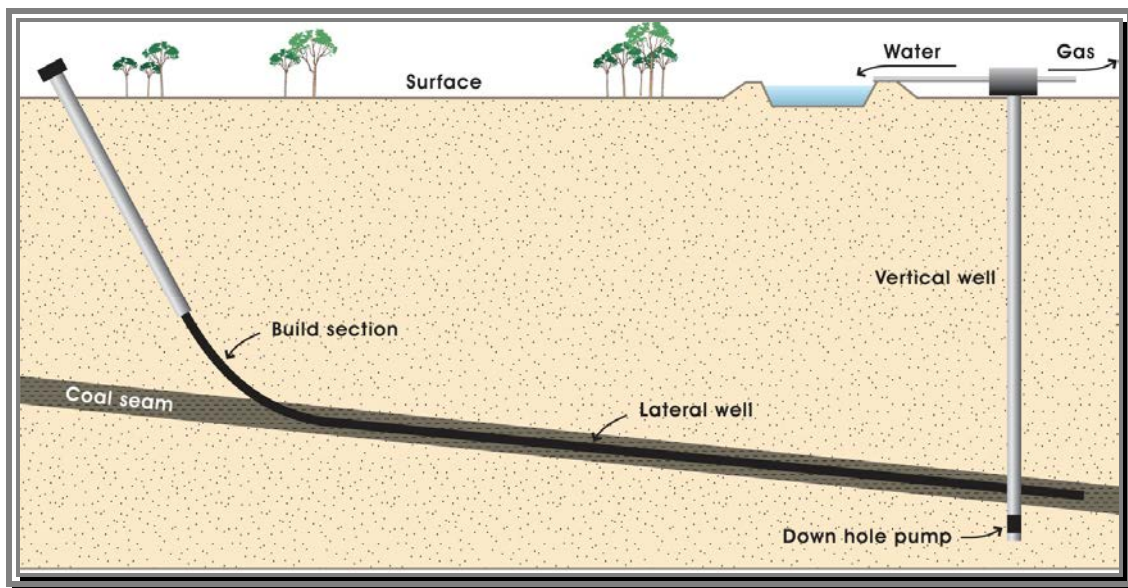
For the RHM underground expansion option and the BRM extension, gas content levels are such that pre-drainage of the gas in the GMS and in many cases the adjacent seams will be required prior to extraction of coal from the GMS. Gas will also need to be managed during mining through ventilation and underground in seam drainage, and after mining through goaf drainage and possibly cross-measure underground drainage.

The construction of infrastructure to drain and manage IMG to enable the safe and efficient mining of coal will be required. An IMG hazard management strategy will be developed to reduce the associated risks.

This will include:

- Pre-drainage of certain coal measures prior to underground mining (using surface to in-seam and underground in-seam methane).
- Dilution of methane through mine ventilation during underground mining, known as ventilation air methane (VAM).
- Post-drainage using goaf drainage bore holes (goaf gas).
- Post-drainage using underground cross-measure drilling.

Figure 3 illustrates the surface to in seam IMG pre-drainage well bore schematic.

Figure 3 - Incidental Mine Gas (surface to in seam) pre-drainage process

The *Mineral Resources Act* (MR Act) places some restrictions on the use of incidental mine gas produced from a mining lease and BMA will ensure compliance with these requirements.

Under a mining lease, IMG can either be:

- used for a beneficial use for mining under the mining lease. An example of beneficial use is power generation;
- supplied to a petroleum lease holder if there is an overlapping petroleum lease (PL).

Other uses, including collecting and piping the gas from a mining lease (ML) for any use, and generating electricity on the ML for sale to the grid are not authorised unless the ML holder also holds a PL.

BMA is investigating a number of options for use of the IMG:

- use for mining under the mining lease including on-site power generation;
- transport or store within the area of the mining lease to allow it to be used beneficially for mining under the mining lease;
- use or disposal for a purpose other than mining, including third-party gas off-take arrangements for use off-site, in accordance with the *MR Act*.

If these options are assessed to be commercially or technically unfeasible, the IMG will be flared.

IMG may also be flared under the following circumstances:

- during early gas pre-drainage phases, small mobile flares may be used before tie-in with a beneficial reuse scheme;
- when the quantity or quality of gas being produced is inadequate for any beneficial reuse, either on or off the ML;
- for safety reasons at any time during mining operations.

3.2 Land use

The BRM panel extensions are located on MLA 70421.

The RHM underground expansion option is proposed to be located partly on the existing ML 1763 and a new mining lease will be sought through conversion of exploration tenure (MLA 70421).

Infrastructure and plant associated with the RHM will be located on ML 1763, ML 1764, ML 1900 and MLA 70421.

BMA is in discussion with the private landowner to secure surface rights not currently held by the CQCA Joint Venture. BMA is the manager of tenements on behalf of the CQCA Joint Venture under a management agreement dated 28 June 2001.

There are 2 exploration permits for petroleum (EPP), one PL resource tenement and 2 petroleum pipeline licences (PPL) held within the proposed study area.

ML 1763, ML 1764 and ML 1802 are granted for the purpose of mining coal and gaseous hydrocarbons. As such, the combined area (12,456 hectares) is excluded from the overlapping EPPs.

MLA 70421 is overlapped by Petroleum Lease Application 486 (PLA 486). Under the *MR Act*, a mining lease applicant is obliged to make reasonable attempts to reach agreement with holders of applicable petroleum tenures in relation to coordination arrangements for respective proposed developments.

Failing agreement, a mining lease applicant may use the statutory process to request the Minister to make a '*preference decision*' about whether the coal resource should be developed in preference to the potential petroleum resources.

2 PPLs have been identified traversing the study area:

- PPL 89 (granted 2003) held by North Queensland Pipeline No 1 Pty Ltd which runs through the western portion of the study area.
- PPL 83 (non-current) held by Stanwell Corporation Limited, which runs through the eastern portion of the study area.

PPL 89 connects Arrow Bowen Basin production facility north of Moranbah to Townsville. PPL 83 is a designated gas pipeline corridor; however this pipeline has not been developed.

The project area is representative of a broader region, which is generally highly modified for mining, grazing and agricultural activities.

The study area is located completely within the Isaac-Connors sub-catchment, of the greater Fitzroy Basin. In the greater regional catchment context, the study area is in the far upstream headwaters of the Fitzroy Basin, and relatively high in the headwaters of the Isaac River sub-catchment.

The Isaac River is the main watercourse traversing the study area and flows south through the site, past Moranbah, and converges with the Connors and then Mackenzie Rivers. The Mackenzie River joins the Fitzroy River, which flows initially north and then east towards the east coast of Queensland. The Fitzroy River flows into the Coral Sea southeast of Rockhampton near Port Alma.

The Isaac River has a catchment area of approximately 1,215 square kilometres at the Goonyella stream gauge located upstream of the existing rail crossing.

At a broader regional scale, the greater Isaac-Connors sub-catchment area (at the confluence with the Mackenzie River) is approximately 22,000 square kilometres and the total Fitzroy River catchment area to the coast is approximately 140,000 square kilometres.

The elevation of the Isaac River channel bed in the study area and through the existing GRB mine complex is approximately 230 to 240 metres above sea level.

3.3 Project need, justification and alternatives considered

While BMA has access to a number of existing and prospective coal resources in the Bowen Basin, the Red Hill Mining Lease resource has been identified for future development on the basis that:

- Broadmeadow Operations panels are to extend into MLA 70421. High quality product coking coal exists within the proposed panel extensions. Without the statutory approvals and conversion of tenure, mining cannot commence or extend across into MLA 70421.
- The resource is a high quality resource that will meet current and expected future market demand.
- The extent and nature of the resource is quite well understood due to extensive exploration and hence BMA can bring this project into production reasonably quickly compared to less well known resources.
- Concurrent mining of different quality coals from the adjacent mines provides a high level of flexibility in terms of product mixes which is not readily achievable where mines are located further away.
- The resource is adjacent to an existing operation, being the GRB mine complex. This provides a number of synergies in terms of water management, water and power supply, ability to share rejects and mine waste disposal facilities and ability to share rail infrastructure, particularly rail loops.

In the event that *the Project* was not to proceed:

- Up to 2,000 potential construction jobs and up to 1,500 full time equivalent potential operational job opportunities, associated with the RHM underground expansion option, would not be created.
- The potential significant flow-on (indirect) employment opportunities would not be created.
- Potential significant export income would not be realised.
- Potential injection of revenue into the regional economy would not occur.
- Potential significant Queensland and Australian Government taxes and royalties would not be generated.
- The potential economic opportunity of developing a coal resource which is viable and in demand would not be realised.
- Emerging overseas markets would potentially be serviced by other mines (either in Australia or elsewhere).

Acceleration of the development of an alternative resource is less attractive due to the higher development and operating cost of the mining activities, and generally lowers resource quality. The potential for integration with existing infrastructure and mine management aligns well with the incremental development of a long life, low cost expandable mining operation.

Alternative mining methods include open cut mining and also conventional longwall mining. Open cut mining is not preferred due to the depth of the resource. The GMS dips downwards towards the east, and hence the quantity of overburden that must be removed becomes prohibitively large to allow efficient resource extraction.

While other underground mining methods are available, the selected longwall top coal caving method reduces environmental impact over an open cut method, and maximises resource extraction, being able to achieve approximately 80 per cent recovery of the coal resource, compared to approximately 50 per cent if conventional longwall mining techniques were used.

This Project will produce metallurgical coal for export, generate and sustain jobs and result in increased investments and royalties for Queensland. The development of *the Project* would seek to supply international markets, particularly for steel manufacturing.

Coal is Queensland's largest export commodity with the Queensland Government benefiting significantly from royalties paid by the mining industry each year. The financial year ending 30 June 2012, yielded the Queensland Government a benefit of approximately \$2.36 billion from coal royalties alone (OESR, 2011). *The Project* will add to the royalties derived from mining activities in each year of operation.

In addition to these economic benefits, BMA, through its existing operations, provides considerable employment and training opportunities through direct and indirect employment and secondary support industries, and extensive support to community development, education, health, social and recreational programs.

The Project's Environmental Impact Statement (EIS) will investigate a number of alternatives to *the Project*. The assessment will include consideration of alternative activities and will address the 'do nothing option'. The EIS will also consider Government priorities and objectives as outlined in relevant Government policies and strategies.

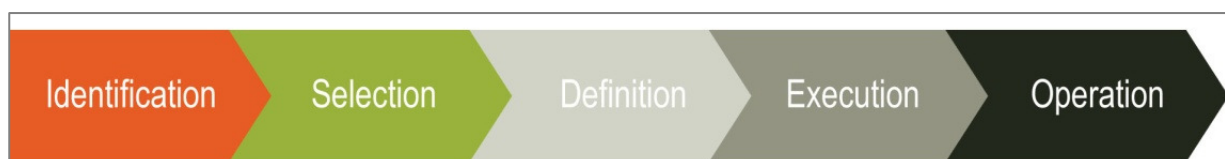
BMA operates within a strict risk management and project decision framework to assess project feasibility. The BHP Billiton project development process is designed to ensure that BMA makes, and then delivers on, good investment decisions.

It is important that these investments:

- are aligned with BHP Billiton values, ethics, priorities, strategies and policies;
- achieve optimal shareholder value with an acceptable degree of risk;
- have an acceptable probability of success;
- are based on a consistent decision framework.

The BHP Billiton development process describes a phased process for conducting studies, undertaking independent reviews and executing projects. An overview of the development process is described in **Figure 4** below.

Figure 4 - BHP Billiton project feasibility and development process



The 4 project development phases are as follows:

- Identification phase: Identifies a development option, assesses the material risk issues, identifies matters to be assessed further during the selection phase and ensures alignment of the potential investment with the business strategy.
- Selection phase: Requires assessment of all reasonable alternatives and selection of the optimal alternative taking into account project economics, risk, uncertainty and embedded option value. The timing for commencing the Selection Phase Study will be determined once the EIS process is complete.
- Definition phase: Defines the development by optimising the selected configuration for project economics and finalising the scope, cost, schedule, and statutory and regulatory approvals/agreements prior to project execution. A project cannot complete the definition phase unless all government approvals and permits are secured.

- Execution and operation phase: Delivers the project through construction and then operation phases.

Each phase has a distinct review and approval process that must be completed before the next phase can commence. The review and sign off process includes consideration of environmental, social and health and safety aspects of the project, as well as the business case for a project which includes assessment of all technical aspects of the project including all value creating alternatives.

Section 8 summarises the key policy and regulatory documentation that applies to *the Project* and outlines the actions to be taken by BMA to address these requirements.

The MWIRP outlines ten desired regional outcomes, supported by a range of policies and programs. The plan establishes a vision and direction for the region to 2031. It provides certainty about where the region is heading and provides a framework to respond to challenges and opportunities that may arise. The ten desired regional outcomes are as follows:

- sustainability, climate change and natural hazards;
- regional landscapes;
- environment;
- natural resource management;
- strong communities;
- strong economy;
- managing growth;
- urban form;
- infrastructure;
- transport.

The EIS will demonstrate that *the Project* elements are able to be constructed, operated and decommissioned in a manner that is compatible and compliant with all current, relevant legislation and policies. The Project is also consistent with the regional planning framework and a planning assessment will be included in the EIS.

3.4 Components, developments, activities and infrastructure that constitute ‘*the Project*’ to be declared coordinated

BMA proposes to convert the existing Red Hill Mining Lease Application (MLA 70421) to enable the continuation of mining operations associated with the existing GRB complex. Specifically, the mining lease conversion will allow for:

- an extension of three longwall panels (14, 15 and 16) of the existing BRM;
- a future incremental expansion option of the existing GRM;
- a future RHM incremental underground expansion option located to the east of GRM which includes the development of key infrastructure.

The BRM longwall panel extensions (14, 15 and 16) will not require additional infrastructure and will utilise the existing BRM workforce.

The potential key infrastructure requirements for the RHM incremental underground expansion option are:

- A CHPP adjacent to the Riverside MIA – the Red Hill CHPP will consist of up to three 1,200 tonne per hour (tph) modules.
- A conveyor system linking RHM to the new MIA and then to the Red Hill CHPP.

- Associated coal handling infrastructure and stockpiles.
- A new conveyor linking product coal stockpiles to the existing rail load-out facility.
- Pipeline connections to the existing GRB mine complex site water management network to allow transfers of mine water to and from RHM.
- 66 kV power connection from the existing infrastructure within the GRB mine complex to the Red Hill CHPP and related infrastructure.
- Relocation and tie-in to 66 kV infrastructure to power the RHM and new MIA.
- A network of bores and associated surface infrastructure over the proposed underground mine footprint of RHM to enable extraction and management of Incidental Mine Gas (IMG). Associated IMG pipeline gathering, control, monitoring and flare infrastructure and a bridge across the Isaac River for all-weather access. This will be located above the main headings, and will provide a crossing point for other mine related infrastructure including water pipelines and power supply.
- Means for providing flood protection to the mine access and MIA, potentially requiring a levee along the west bank of the Isaac River.
- An on lease accommodation village (Red Hill accommodation village).

3.5 External infrastructure requirements

3.5.1 Rail capacity

It is intended that coal will be transported to port facilities by rail. At full potential production for the underground expansion option, four to five trains will be required each day.

Options available for coal transport and export include the following:

- The GRB mine complex is serviced by an Aurizon rail network. The Goonyella system transports coal from two existing rail loops located on the west of the mine complex to the existing Hay Point Coal Terminal for shipping.
- If this system is to be used, a conveyor will be constructed from the Red Hill CHPP to the Riverside rail loop and existing train load-out facility. BMA is currently constructing an expansion to the Hay Point Coal Terminal and coal from the RHM underground expansion option may be exported through this terminal.

Aurizon has also recently completed a rail connection from Goonyella to Abbot Point where there is an existing coal export terminal.

The capacity of the existing coal terminal at Abbot Point is not expected to be adequate for use by *the Project*; however, BHP Billiton has obtained development rights for a dedicated coal export terminal at Abbot Point. Product coal from the GRB complex, including the proposed RHM underground expansion option, may export from Abbot Point in the future subject to regulatory approval and project sanction.

BHP Billiton continues to assess the best port and rail infrastructure solutions to accommodate its future growth from its Bowen Basin assets. The timing of any potential port development beyond the current expansion of the Hay Point Terminal (HPX3) will be linked to the Company's future growth plans.

3.5.2 Port capacity

The Hay Point Coal Terminal is located approximately 40 km south of Mackay and commenced operations in the 1970s. The Hay Point Coal Terminal is owned and operated by BMA. The terminal has a capacity of approximately 44 mtpa. BMA has approval to increase capacity up to 55 mtpa and construction works have recently commenced.

The Abbot Point Coal Terminal is located approximately 25 km north of Bowen on the Central Queensland Coast. In May 2010, BHP Billiton was awarded preferred developer status by North Queensland Bulk Ports Corporation Limited for a 60 mtpa facility (Terminal 2).

The timing of any potential port development beyond the current expansion of the Hay Point Coal Terminal (HPX3) will be linked to the Proponent's future growth plans.

3.5.3 Airport capacity

The existing Moranbah Airport is owned by BMA and it is proposed to be utilised for the transportation of *the Project* workforce. Currently, the Moranbah airport is operating approximately 60 roundtrip flights per week on Turboprop aircraft that carry up to 75 passengers per flight. Approximately 200,000 passengers used Moranbah airport in 2012. In December 2012, BMA received a development approval from the Isaac Regional Council that provides for up to 480,000 passengers to use the airport.

The current usage levels are well under half this capacity. Additional roundtrip flights are expected for the Daunia and Caval Ridge Projects, which are to commence operations in 2013 and 2014 respectively.

During peak operations, the Red Hill underground expansion option has the potential to result in up to 30 additional round trips per week. It is expected that any increase can be accommodated within the approved capacity of the Moranbah airport.

3.5.4 Road transportation

No additional traffic will be generated by the BRM panel extensions.

Access to the MIA, mine entrance and Red Hill accommodation village associated with the RHM underground expansion option are proposed via Red Hill Road. Access to the CHPP will be through the main GRB mine complex site entrance off Goonyella Road.

There are no off lease road upgrades or realignments proposed for *the Project*. Traffic monitoring at Goonyella Road (between Red Hill Road and the railway overpass) may be carried out to monitor the traffic volumes on Goonyella Road for the first years of operating the RHM underground expansion option.

It is expected that construction and operation traffic will access the site from the Peak Downs Highway, via the Goonyella Road (BMA owned) and Red Hill Road.

3.5.5 Associated infrastructure requirements

3.5.5.1 Power supply

The current GRB mine complex operations have a power requirement of 50 megawatts (MW). At peak production, the RHM underground expansion option has the potential to require approximately 50 MW of additional power. New power lines are currently being constructed which will allow a supply of 104 MW, thus covering both the existing and proposed operations.

Proposed new power reticulation associated with the RHM underground expansion option would involve:

- Supply to the CHPP and related infrastructure via a new 66 kilovolt (kV) overhead line from the existing GRM 132/66 kV substation to a new 66/11 kV substation to be located adjacent north of the existing Riverside rail loop.
- Supply to the RHM underground operations (underground and MIA) is proposed via a connection to the relocated 66 kV infrastructure on the eastern side, which may also require augmentation of the existing 66 kV infrastructure and construction of tie-lines around the northern lease area.

There may also be a need for temporary power lines for infrastructure associated with IMG management.

All required power reticulation is within existing mining leases. Mining of the BRM extensions will not increase the power requirements for BRM.

3.5.5.2 Relocation of existing power lines

Subject to the likelihood of subsidence based on final mining plans, the following may require relocation:

- the Powerlink 132 kV switchyard located north of the RHM underground expansion option;
- the Powerlink 132 kV overhead line traversing the Red Hill mining lease.

3.5.5.3 Water supply

The BRM panel extensions will utilise existing infrastructure and not increase peak demand for water.

Sufficient raw water supply is available to meet the projected demands of the RHM underground expansion option in an average year. However, should there be a short-fall, a network of pipelines will be utilised to deliver external raw water.

The Sunwater Burdekin to Moranbah pipeline allows for the supply of 16,800 mega litres (ML) per year to the Bowen Basin coal mines and the town of Moranbah.

The BMA allocation from this source is 8,000 ML/year (from July 2010) which will increase, after 1 July 2013, to the full allocation of 10,168 ML/year.

BMA's Eungella water pipeline also supplies water from the Eungella dam. BMA's Eungella pipeline 1 supplies 6,200 ML/year to the GRB mine complex and Peak Downs Mine.

In addition to the Sunwater Burdekin to Moranbah pipeline and the BMA Eungella (pipeline 1) supplies, supplementary water allocations for the BMA mines within the Bowen Basin include:

- an allocation of 7,400 ML/year from the BMA Bingegang Pipeline; Bingegang Weir on the Mackenzie River;
- Selma Weir - BMA Selma Pipeline to the Gregory Crinum Mine, 1,600 ML/year;
- Bedford Weir - BMA Bedford East and Bedford West pipelines to Blackwater Mine, 2,281 ML/year.

BMA has an option for an additional 1,708 ML/year from the Burdekin to Moranbah pipeline.

3.5.5.4 Interactions with existing Sunwater Eungella Water Pipeline

The Eungella pipeline runs across the proposed RHM footprint. Depending on the extent of subsidence, this pipeline may be affected. If it is predicted to be affected, the pipeline will be replaced or relocated from its current location. This will be undertaken in consultation with asset owners, currently Sunwater, through Eungella Water Pipeline Pty Ltd.

3.5.5.5 Sewage treatment

A new sewage treatment plant (STP) will be installed adjacent to the existing STP at the Riverside MIA, to cater for the new CHPP for the RHM underground expansion option. New STPs would also be required at the new MIA and at the proposed Red Hill accommodation village.

Effluent from the sewage treatment plant will be managed as part of *the Projects* overall water management system.

Mobile toilet facilities may be required during installation of IMG management infrastructure.

3.5.5.6 Telecommunications

The telecommunications network will be managed by extending the existing services from the GRB mine complex through to the project site.

3.5.5.7 Fuel and lubricant storage

Diesel and oil storages will be designed to Australian Standard 1940 - Storage and handling of flammable and combustible liquids. Refuelling areas will be fully contained using rollover bunds, with the contained areas draining to an oil-water separator.

Total on site storage capacity will be in the order of 200 kilolitres. Diesel will be brought to the site by road tanker from Mackay.

3.6 Timeframes for *the Project* components

3.6.1 Project staging overview

The extension of three longwall panels (14, 15 and 16) at BRM are planned to commence in FY 2016. The proposed extensions will not require any additional infrastructure and will rely on the existing BRM workforce.

The incremental expansion options for GRM and RHM are subject to a capital investment approval by the owners. The timing for further investigation and consideration of these options will be undertaken once approvals are finalised for *the Project*.

3.6.2 Mine sequence

Mining of the proposed BRM panel extensions will occur in sequence with the current BRM mine plan. Current scheduling estimates commencement of development of LW 14 extension in FY2016. The longwall panels are extracted from the furthest mining extent, working back towards the main headings.

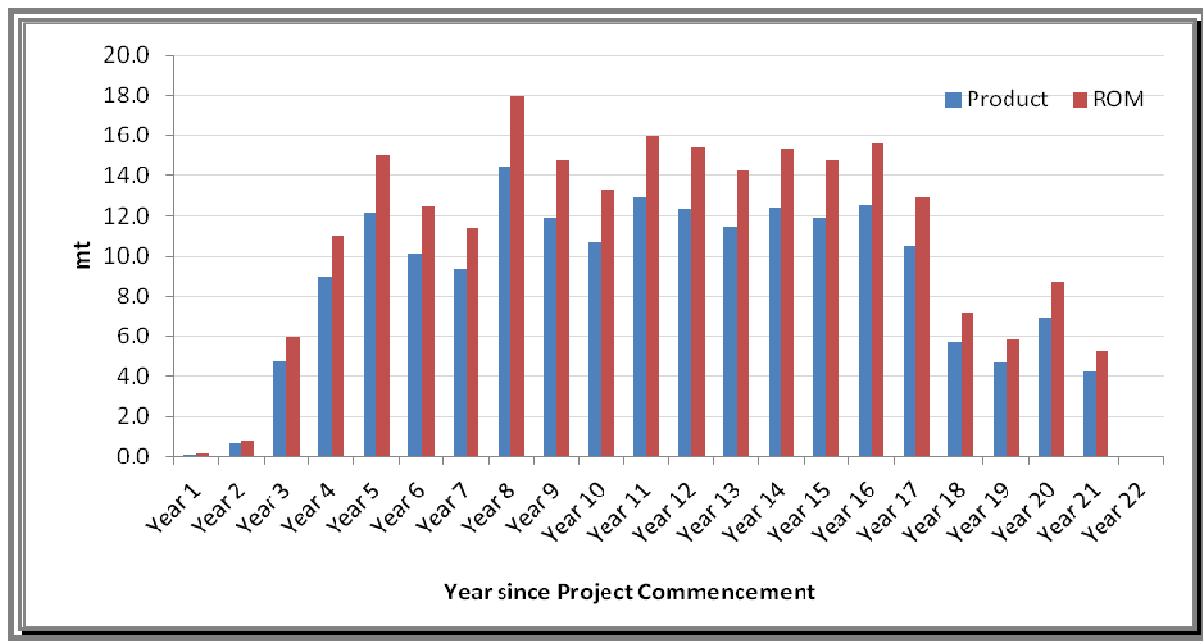
The ultimate timing for commencement, the rate of development and scale of future production for future RHM underground expansion option has not been determined by the owners and is subject to the owner's capital investment approval. It is anticipated that mining would commence from the main heading, with panels extending along strike, roughly north and south, of the main heading.

3.6.3 Coal production schedule

Access to commence development works for mining the proposed Broadmeadow extensions is scheduled to commence in FY 2016. The panel extensions will extend the LOM for BRM by approximately 1 year and produce up to 5 million tonnes of ROM coal.

The RHM underground expansion option has the potential to extract up to 236 million tonnes of ROM coal, producing up to 14 mtpa of high quality hard coking product coal.

A number of factors affect annual production rates, and forecast of annual production figures over this period is indicative only as the timing for commencement, rate of development and scale of future production has not been determined by *the Project* owners. An indicative production profile is provided in **Figure 5**.

Figure 5 - Indicative coal production profile for the RHM underground expansion option

3.6.4 Hours of operation

Mine construction and operation hours within GRB complex are currently 24 hours a day, seven days a week, 365 days a year. All elements of *the Project* will maintain the same hours of operation for construction and operation.

3.7 Construction and operational processes

The BRM panel extensions will not require additional mining infrastructure and will form part of the existing BRM operations.

The potential construction requirements for the RHM underground expansion option are as follows:

- A CHPP adjacent to the Riverside MIA – the Red Hill CHPP will consist of up to three 1,200 tonne per hour (tph) modules.
- A conveyor system linking RHM to the new MIA and then to the Red Hill CHPP.
- Associated coal handling infrastructure and stockpiles.
- A new conveyor linking product coal stockpiles to the existing rail load-out facility.
- Pipeline connections to the existing GRB mine complex site water management network to allow transfers of mine water to and from RHM.
- 66 kV power connection from the existing infrastructure within the GRB mine complex to the Red Hill CHPP and related infrastructure.
- Relocation and tie-in to 66 kV infrastructure to power the RHM and new MIA.
- A network of bores and associated surface infrastructure over the proposed underground mine footprint of RHM to enable extraction and management of Incidental Mine Gas (IMG). Associated IMG pipeline gathering, control, monitoring and flare infrastructure and a bridge across the Isaac River for all-weather access. This will be located above the main headings, and will provide a crossing point for other mine related infrastructure including water pipelines and power supply.
- Means for providing flood protection to the mine access and MIA, potentially requiring a levee along the west bank of the Isaac River.

- An on lease accommodation village (Red Hill accommodation village).

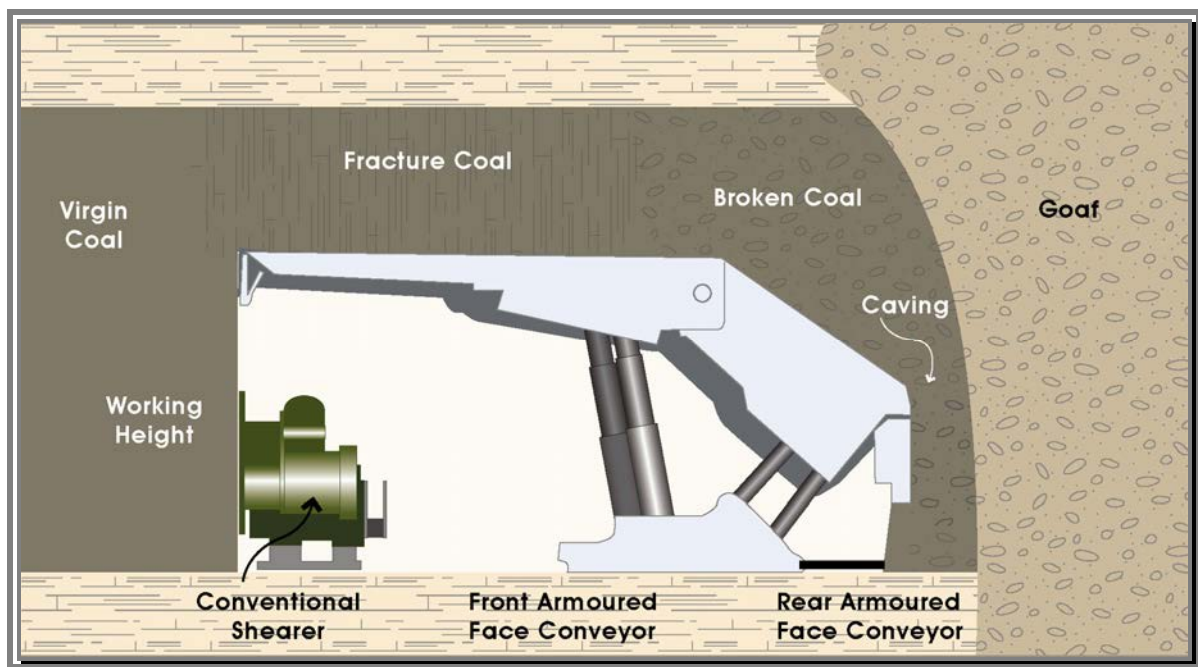
The operational interactions with GRB for management of water and waste are described in Section 7.3.

The depth of the coal seams throughout the project area is such that underground mining provides the most effective method of extraction. The mining method and orientation of the mine has been designed to account for variable fault structures and to maximise resource extraction.

As the GMS is up to 10 metres thick, it is too thick for the entire depth of the seam to be extracted using conventional longwall mining, which can typically only remove a thickness of up to six metres. Therefore, both RHM and the Broadmeadow extension will be longwall mines, and will utilise thick seam mining (TSM) techniques to maximise resource recovery and efficiency.

The TSM equipment differs from conventional longwall mining equipment in that it has a hydraulic roof support system that can be raised and lowered, allowing coal above the area cut by the shearers to cave in behind the mining face, falling onto a rear armoured face conveyor as shown in **Figure 6**.

Figure 6 - Thick Seam Mining Equipment



Planning for mine closure includes integrating the closure design for the entire EIS study area, identifying the timing of the planning process, considering issues that relate to specific rehabilitation methods and financial and community objectives, as well as making sure adequate financial provision has been made.

The principal objectives of rehabilitation and mine closure planning incorporated into each stage of *the Project* will include:

- to provide an overall framework for mine closure, including rehabilitation and decommissioning strategies;
- to establish clear and agreed criteria with all relevant stakeholders, that can be used as the standard for the final mine rehabilitation and post mining land use assessment;
- to reduce or eliminate adverse environmental effects once the mine ceases operation;
- to ensure closure is completed in accordance with good industry practice as well as meeting the statutory requirements that may be applicable; and

- to ensure the closed mine does not pose an unacceptable risk to public health and safety.

The rehabilitation objectives to be achieved for each stage of *the Project* are as follows:

- Achievement of acceptable post-disturbance land use suitability – mining and rehabilitation should aim to create a landform with land use capability and/or suitability compatible with the land-use pre-mining, unless other beneficial land uses are pre-determined and agreed.
- Creation of stable post-disturbance landform – disturbed land and subsided areas will be rehabilitated to a condition that is self-sustaining or a condition where maintenance requirements are consistent with an agreed post-mining land use. Surface waters such as dams retained on the lease should be safe, self-sustaining and be acceptable for the post mining land uses.
- Preservation of downstream water quality – water quality of surface and ground waters that leave the mining leases should be adequate to maintain environmental values and beneficial uses downstream of the proposed EIS study area.

Following final rehabilitation, the project area will be safe, stable and sustainable. Current expectations in relation to post mining land use are that rehabilitation will return those areas of the EIS study area disturbed by *the Project* to a stable landform capable of supporting cattle grazing as per the current land use.

3.7.1 Mine entry

For the Broadmeadow extension, the proposed panels are extensions of the panels 14, 15 and 16 in the existing mine plan. These existing panels are accessed directly from adjacent open-cut highwalls within ML 1763 and hence a drift and main headings are not required.

Access to the RHM underground expansion option is proposed to be via a drift of approximately 2,000 metres in length, which will intersect the GMS at an approximate depth of 200 metres. Once the target depth has been reached, the main entrance to the mine, known as pit bottom, will be established and transportation and ventilation systems installed.

Conveyors will be installed in the drift to bring coal to the surface, and roadways and other infrastructure requirements will also be established.

The longwall panels are created by driving parallel development headings known as gate roads on either side of the panel from the main heading to the extent of the longwall block.

The headings are then connected together across the end of the longwall panel, which allows the longwall machinery to be installed and the ventilation circuit to be set up.

Roadways are separated by sections of un-mined coal called pillars, which remain in place after mining is completed. The pillars provide roof support for the roadways, which are developed by continuous miners.

Roadways form passages for access, ventilation, machinery, electrical supply, communication systems, water, and compressed air lines. The roadways connect to main east-west headings, which connect to inclined drifts providing access to the surface. Vertical shafts provide ventilation and emergency access to the surface if required.

3.8 Workforce requirements during construction and operation

The extension of Broadmeadow into MLA 70421 will rely on existing operations and will not require an additional workforce or the development of key mining infrastructure.

Subject to the timing for capital investment by *the Project* owners and the proposed rate of development, the construction workforce for the RHM underground expansion option has the potential to peak at up to 2,000 people, including employees involved in the construction of the mine, CHPP, MIA and supporting infrastructure.

The operational phase has the potential to employ up to 1,500 people.

The Red Hill accommodation village is proposed for the construction and operational remote workforces with capacity for up to 3,000 workers. This capacity may be required as there is potentially some overlap between construction and operation workforces. The final rate of development may alter some of these workforce projections. The location of the proposed village is provided in **Figure 2**.

Workforce arrangements and associated accommodation requirements will be further developed and presented in the EIS.

The preferred arrangement will be informed by investigations into operational requirements, taking into consideration the skills required, labour availability, rostering and planning, and social impacts and benefits.

3.9 Economic indicators

The BRM panel extensions will not be included in the economic assessment as no additional capital expenditure or increased operating costs are required for BMA. The extensions will not require any additional workforce of infrastructure and will not increase the annual production out of BRM.

The timing for commencement, the rate of development and scale of future production for the RHM underground expansion option has not been determined and is subject to the owner's approvals. The capital and operating costs and annual contribution to local/state/national economies will depend on the proposed staging, rate of production and scale of future development.

The Proponent will prepare an economic impact assessment for the RHM underground expansion option which assesses the key economic indicators for *the Project* based on a peak development and operating scenario of 14mtpa over a Life of Mine (LOM) of 25 years. For the purposes of modelling, the assessment will assume a construction commencement date.

3.10 Financing requirements and implications

The BRM extensions will not require additional capital expenditure or result in increased operating costs for BMA. The existing workforce at BRM will not increase as a result of the panel extensions and no additional infrastructure is required.

The RHM underground expansion option will require capital and operating expenditure which is not yet committed by the owners. Once the owners have determined the preferred staging and rate of development, formal endorsement and commitment of funds is required.

BMA has funded, developed and operated mines in the Bowen Basin over a long period of time. **Figure 1** provides a summary of the current operations developed by BMA.

A separate financial and technical capability statement has been prepared for assessment by the Coordinator General. The statement addresses BHP's approach to the project development process.

The BHP Billiton project development process is designed to ensure that BMA makes, and then delivers on, good investment decisions. It is important that these investments:

- are aligned with BHP Billiton values, ethics, priorities, strategies and policies;
- achieve optimal shareholder value with an acceptable degree of risk;

- have an acceptable probability of success;
- are based on a consistent decision framework.

4 Location of key project elements

4.1 Location

The Red Hill Mining Lease is located approximately 20 kilometres north of Moranbah and 220 kilometres south-west by road from Mackay. Mackay is the main urban and administrative hub for the Mackay, Whitsundays and Isaac Region. Mackay is located on the coast, approximately 20 kilometres north of Hay Point and a 2.5 hour drive from Moranbah via the Peak Downs Highway. Moranbah is the closest town to *the Project* and includes a number of regionally important land use activities including industrial, commercial and residential type uses sited within well-defined urban boundaries. Moranbah is one of the largest inland towns servicing mining within the Bowen Basin.

The populations and proximity to communities within the region are briefly described in **Table 2 – Regional Centres**.

Table 2 - Regional Centres

Town	Population	Non-Resident Worker Population	Separation Distance	Direction from Project
Moranbah	8,511	2,931	20 km	south
Coppabella	624	1,438	40 km	south-east
Nebo	342	801	73 km	east
Dysart	3,447	1,480	100 km	south-south-east
Clermont	1,948	347	124 km	south-west
Middlemount	2,249	1,431	139 km	south-east
Mackay	78,214	N/A	141 km	east-north-east

The extension of the BRM LW panels does not require the expansion of the BRM MIA, CHPP or supporting infrastructure. These existing panels are accessed directly from adjacent open-cut highwalls within ML 1763 and hence a drift and main headings are not required.

The location of key project infrastructure and facilities associated with the RHM underground expansion option is indicated in **Figure 2**.

Once the projects owners determine to proceed with the RHM underground expansion option, it is likely that staged development of infrastructure will occur along with the optimisation of existing on site infrastructure.

At full production, the RHM underground expansion option will require the following infrastructure to facilitate mining:

- A network of bores and associated surface infrastructure over the underground mine footprint to enable extraction of IMG and management of goaf methane.
- A ventilation system for the underground workings.
- A new MIA.
- A new CHPP adjacent to the Riverside MIA – consisting of up to three 1,200 tonne per hour (tph) modules.
- A conveyor system linking RHM to the Red Hill CHPP.

- Associated coal handling infrastructure and stockpiles.
- A new conveyor linking product coal stockpiles to an existing rail load-out facility.
- Pipeline connections to the existing GRB mine complex site water management network to allow transfers of mine water to and from RHM.
- A 66 kV power connection from the existing infrastructure within the GRB mine complex to the Red Hill CHPP and related infrastructure.
- Relocation and tie-in to 66 kV infrastructure to power the RHM and new MIA.
- A new accommodation village (Red Hill accommodation village) for the construction and operational remote workforces with capacity for up to 3,000 workers. This is required as there is potentially some overlap between construction and operation workforces. The peak workforce numbers may vary depending on the staging of development.
- A bridge across the Isaac River for all-weather access. This will be located above the main headings, and will also provide a crossing point for other mine related infrastructure including water pipelines and power supply.
- Means for providing flood protection to the RHM mine access and MIA, potentially requiring a levee along the west bank of the Isaac River.

The majority of the proposed infrastructure will be located on ML 1763, MLA 70421, ML 1900 and ML 1764. Construction and assembly would occur on-site using prefabricated units and infrastructure components where possible. Some building modules may be manufactured off-site.

The infrastructure areas may require the supply of materials such as gravel and or rock for fill.

This material will be supplied in order of preference from:

- within the footprint of the proposed underground expansion;
- a nearby licensed facility;
- a nearby source of suitable quarry material as identified and developed by BMA.

The approvals that may be required for the above options are identified in **Table 10**.

Access to the underground workings is proposed to be via a drift of approximately 2,000 metres in length, which will intersect the GMS at an approximate depth of 200 metres. Once the target depth has been reached, the main entrance to the mine, known as pit bottom, will be established and transportation and ventilation systems installed.

Conveyors will be installed in the drift to bring coal to the surface, and roadways and other infrastructure requirements will also be established.

The GIS data for the project study area has been provided in ESRI shapefile format (Datum:GDA94).

The property descriptions for each mining and property tenure are provided in Figure 7.

4.2 Tenure

Details of all mining tenements and land tenure are provided in **Table 3** and presented in **Figure 7**.

The project site is located within the Isaac Regional Council (IRC) Local Government Area (LGA). IRC consists of the former Nebo, Belyando and Broomsound Shire Council areas. The project site is located within the former Belyando and Nebo Shire Council LGA's. There is currently no consolidated planning scheme in force for IRC and the planning schemes of the former Councils remain in effect.

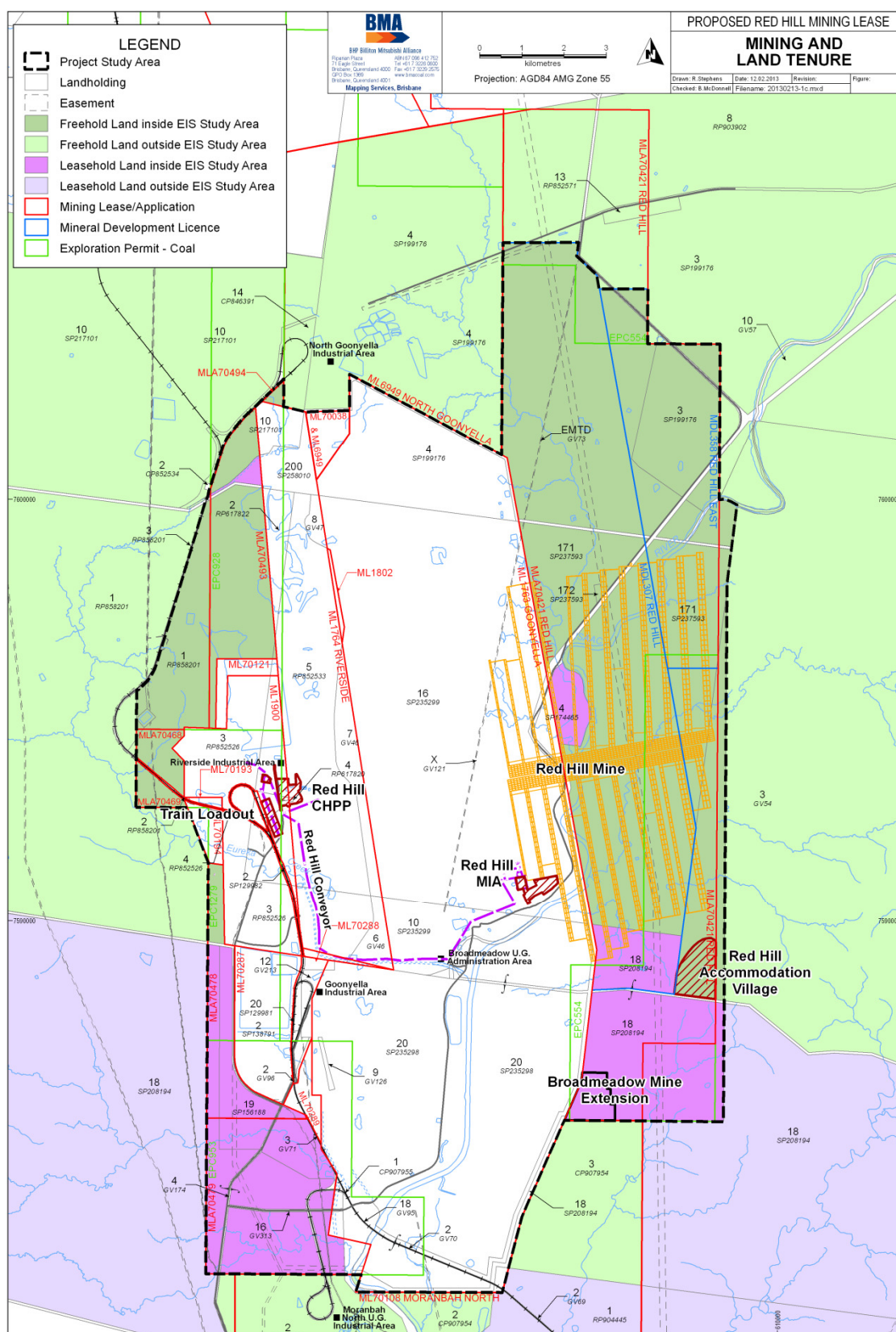
Relevant land use and planning aspects of *the Project* will be assessed against the Nebo Shire Planning Scheme and the Planning Scheme for the Belyando Shire. Should a draft Planning Scheme for IRC be available for public comment at the time of preparing the EIS, the relevant provisions of this document will be given consideration in assessing the land use impacts of *the Project*.

The Mackay, Isaac and Whitsunday Regional Plan, released on 8 February 2012, will also be considered in assessing the land use impacts of *the Project*.

Table 3 - Tenure and location of key infrastructure and activities

Mining Tenure	Name	Development Associated with <i>the Project</i>
MLA 70421	Red Hill	Underground mining, gas drainage, accommodation village and infrastructure., refer Figure 2
MDL 307	Red Hill	Underground mining, gas drainage, accommodation village and infrastructure, refer Figure 2
MDL 358	Red Hill East	Underground mining, gas drainage and infrastructure, refer Figure 2
EPC 554	Red Hill	Underground mining, gas drainage, accommodation village and infrastructure, refer Figure 2
ML 1763	Goonyella	Underground mining, drift, gas drainage infrastructure, MIA and infrastructure, refer Figure 2
ML 1764	Riverside	Infrastructure, refer Figure 2
ML 1900	Riverside West	CHPP, conveyors, trainload out facilities and infrastructure, refer Figure 2 .

Figure 7 - Mining & Land Use Tenure



5 Description of the existing environment

5.1 Natural environment

5.1.1 Land

The project area is representative of a broader region, which is generally highly modified for mining, grazing and agricultural activities.

Existing land uses within the EIS study area and surrounds are described below:

- biophysical elements (such as the Isaac River);
- mining and coal exploration activities;
- Agricultural activities such as:
 - cattle grazing;
 - farming infrastructure (access tracks, fences, stockyards and sheds).
- residential and urban land uses, that include:
 - several rural residential dwellings (homesteads) that are located within the EIS study area (Riverside Homestead and Broadmeadow Homestead, and associated cottages);
 - rural residential dwellings (homesteads) that are located in the surrounding rural area;
 - nearby urban and peri-urban development, namely Moranbah town and the surrounding development.

The study area is located completely within the Isaac-Connors sub-catchment, of the greater Fitzroy Basin. In the greater regional catchment context, the study area is in the far upstream headwaters of the Fitzroy Basin, and relatively high in the headwaters of the Isaac River sub-catchment.

The Isaac River is the main watercourse traversing the study area and flows south through the site, past Moranbah, and converges with the Connors and then Mackenzie Rivers. The Mackenzie River joins the Fitzroy River, which flows initially north and then east towards the east coast of Queensland. The Fitzroy River flows into the Coral Sea southeast of Rockhampton near Port Alma.

The Isaac River has a catchment area of approximately 1,215 square kilometres at the Goonyella stream gauge located upstream of the existing rail crossing.

At a broader regional scale, the greater Isaac-Connors sub-catchment area (at the confluence with the Mackenzie River) is approximately 22,000 square kilometres and the total Fitzroy River catchment area to the coast is approximately 140,000 square kilometres.

The elevation of the Isaac River channel bed in the study area and through the existing GRB mine complex is approximately 230 to 240 metres above sea level.

5.1.2 Water

5.1.2.1 Surface water

The Project is located within the headwaters of the Isaac-Connors sub-catchment, of the greater Fitzroy Basin. The proposed activities for the RHM underground expansion option span across the Isaac River and tributary catchments of Goonyella Creek and 12 Mile Gully. Other tributaries in the area include Eureka Creek, Fisher Creek, and Platypus Creek, all of which flow into the Isaac River downstream of the proposed RHM.

A study of the flood hydraulic conditions within the watercourses traversing the study area will be undertaken to assess the flooding impacts of the proposed project. Six 'waterways' classified as defined *watercourses* (under section 5 of the *Water Act 2000*) have been identified within the EIS study area. These are the Isaac River and its tributaries: Goonyella Creek; Eureka Creek; 12 Mile Gully; Fisher Creek; and Platypus Creek.

The Isaac River and tributaries in and around the study area are ephemeral. Base flow appears to be sustained by surface base flow stores rather than distinct groundwater contribution. Flow is typically limited to a few days up to approximately less than one or two weeks after surface runoff (quick flow) has drained from contributing sub-catchments.

As part of the proposed RHM underground expansion option, sections of these creeks would need to be managed to reduce the impact of subsidence on the creeks' physical and biological environments as well as the impact on flows to downstream users. Approvals including but not limited to those required under the *Water Act 2000* will be sought as required.

5.1.2.2 Groundwater

Groundwater occurs in the unconsolidated and consolidated alluvial and sedimentary rocks within and adjacent to the project area. Existing information characterises groundwater quality as brackish to saline and this is not expected to change through the operation of *the Project*.

Groundwater supply is not considered to be a major water source in the groundwater survey area. Based on a review of available data, the beneficial use of groundwater in the groundwater survey area is considered to be low due to low sustainable yields and poor groundwater quality.

5.1.3 Air

Air quality in the region is mainly influenced by pastoral activities, open-cut mining, and nearby rail and road transportation activities. Receptors include isolated homesteads and cottages, some of which are owned or managed by BMA or BHP Billiton Mitsui Coal Pty Ltd (BMC). Receptors will be confirmed during the EIS.

The BRM panel extensions will not generate additional dust as access will be gained from the existing underground operations on ML 1763.

The potential dust sources from the underground expansion option during construction will include earthworks and increased traffic movements.

The anticipated dust sources from the underground expansion option during operation are minor and are not expected to impact on any receptors in the vicinity of the study area however they are likely to include some heavy mining equipment movements and coal handling and processing.

The EIS will investigate a range of air quality issues and will identify potential receptors. A predictive air quality model will be developed to support the impact assessment process.

The Project's vulnerabilities to climate change will be addressed by conducting a risk assessment on the impacts of changes in rainfall, temperatures, rainfall intensity, storm severity, number of windy days, and likelihood of flooding. The methodology and results of this assessment will be presented in the EIS. Climate change risk management strategies will also be presented to allow *the Project* to adapt to future climate change.

Effects of climate change may include temperature change, rainfall change, relative humidity, sea surface temperature, wind speed and potential evapotranspiration.

5.1.4 Ecosystems

The flora surveys also identified a total of 20 regional ecosystems, including five listed as endangered, 8 of concern, and 7 least concern under Queensland vegetation management legislation.

In addition to the regional ecosystems and threatened ecological communities, literature reviews have identified seven species of conservation significance as potentially occurring in the study area.

Of these, field surveys undertaken to date have confirmed the presence of 2:

- *Dichanthium setosum* (bluegrass) - listed as near threatened under the *Nature Conservation Act 1992 (NC Act)* and vulnerable under the *EPBC Act*.
- *Cerbera dumicola*, which is listed as near threatened under the *NC Act*.

The conservation significant *Dichanthium queenslandicum* (king bluegrass) and *Digitaria porrecta* (finger panic grass), were identified as being potentially present given the types of habitat available on site, but have not been recorded on site.

In addition to the conservation significant vegetation ecosystems, communities and species on the site, there have also been 46 exotic species identified. 5 of these species were identified as being of management concern; *Eriocereus martinii* (harrisia cactus), *Parthenium hysterophorus* (parthenium), *Sporobolus fertilis* (giant Parramatta grass), *Opuntia stricta* var. *stricta* (prickly pear) and *Opuntia tomentosa* (velvety tree pear).

These species are currently declared as Class 2 pest species under the *Land Protection (Pest and Stock Route Management) Act 2002* and *Parthenium hysterophorus* (parthenium) is also listed as a Weed of National Significance.

5.1.5 Flora and fauna

The project area is part of the Brigalow Belt North Bioregion. Floristic surveys of the project area have been carried out between 2002 and 2011 within and adjacent to *the Project* boundaries.

The ecological values of the project area are typical for the northern Bowen Basin with large areas of land historically cleared for grazing. Although some areas of remnant vegetation remain, most have been modified to some extent by historical and current land management practices.

Fauna surveys of the project area have been carried out between 1998 and 2011. The aim of the fauna surveys was to document the terrestrial vertebrate fauna and habitat, with particular reference to the occurrence of conservation significant fauna and to undertake assessment of potential impacts to the fauna as a result of *the Project*.

5.2 Social and economic environment

5.2.1 Economic and demographic characterisation

The area surrounding *the Project* supports mining, gas and agricultural activities. The potential impacts and opportunities to enhance the benefits of *the Project* will be identified during the EIS process.

The Moranbah community will be the community potentially subject to the greatest level of influence associated with the RHM underground expansion option.

Potential impacts and benefits will also be experienced at wider regional levels such as the IRC LGA and the Mackay, Isaac and Whitsunday Region.

To ensure these issues are well understood, stakeholders, including community members, will be consulted as part of the EIS process. This process is discussed further in Section 10.

5.2.2 Accommodation and housing

The BRM panel extensions will not require additional workforce as the mining operations will be undertaken by the existing BRM workforce. No additional infrastructure is required in order to facilitate mining of these extensions.

The RHM underground expansion option has the potential to employ up to 2,000 construction employees and up to 1,500 operational employees at full production. A proposed new accommodation village (Red Hill accommodation village) for the construction and operational remote workforces has the potential to accommodate up to 3,000 workers.

The ultimate capacity of the accommodation village will be determined by the rate and scale of future development sanctioned by the owners. The 3000 person village capacity accounts for a peak workforce arising out of a potential overlap between construction and operations.

5.2.3 Social and recreational services

BMA, through its existing operations, provides extensive support to community development, education, health, social and recreational programs.

Recent social and recreational facilities have been constructed in Moranbah and include a Regional Youth and Community Services Centre the redevelopment of the Greg Cruickshank Aquatic Centre. These construction and upgrade of these facilities were made possible by BMA's Moranbah Community Support Package.

5.2.4 Cultural heritage (Indigenous and non-indigenous)

As part of the EIS, assessment of the Aboriginal cultural heritage values of the project site will be undertaken in consultation with the Barada Barna people and Wiri Core People cultural heritage groups.

Where appropriate, cultural heritage management plans will be prepared jointly with relevant Aboriginal parties to address survey and monitoring requirements and mitigation of impacts and management of cultural heritage material during the construction and operation of the mining activity.

The EIS will also survey and evaluate the significance of any non-Indigenous heritage sites that may be present within the project site.

5.3 Built environment

The vicinity around the project area includes a variety of major developments currently being assessed or approved and being implemented.

Projects currently undergoing assessment or having recently completed assessment under these processes and which will be included in the cumulative impact assessment for *the Project* are listed in **Table 4**. Potential capacity constraints as well as potential cumulative impacts will be determined during the EIS phase of *the Project*.

A summary of known projects in the region are as follows:

Table 4 - Adjoining & Surrounding Projects

Project Proponent	Description	EIS Status	Relationship to Red Hill Mining Lease Project	
			Timing	Location
Eaglefield Coal Mine Expansion-Peabody	Expansion of existing open-cut mine from 5 to 10 mtpa. Construction workforce will be 650 and the operational workforce will be 700. Construction commenced in 2012 with full production by 2016. Accommodation will be at on-site facilities.	EIS complete	Possible overlapping operational phase with proposed project	Abuts the northern boundary of the Goonyella Riverside Mining lease. Drains to Goonyella Creek sub-catchment

Project Proponent	Description	EIS Status	Relationship to Red Hill Mining Lease Project	
			Timing	Location
Ellensfield Coal Mine Project - Vale	New underground coal mine to produce 5.5 mtpa. Development also includes an on-site gas fired power station (8 to 20 MW). Construction workforce will be 160 and the operational workforce will be 280. Accommodation will be at Coppabella or Moranbah.	EIS complete	Possible overlapping operational phase with proposed project.	121 km to the west of the EIS study area May utilise the same transport networks and may locate workers at Moranbah. Located within the Isaac River sub-catchment.
Grosvenor Coal Mine Project – Anglo Coal	Greenfield undergrounds mine to produce 7 mtpa. Construction and operation workforces will both be approximately 500 persons. Construction commenced in 2012 with full production by 2015. Workforce accommodation 25% in Moranbah and 75% remote workforce.	EIS process completed	Possible overlapping operational phase with the proposed project.	9 km to the south of the EIS study area. Land surface drains to the Isaac River. May utilise the same transport networks and will locate workers and accommodation facilities at Moranbah.
New Lenton Coal Mine Project – New Hope	Greenfield open-cut and underground mine to produce 5 mtpa. Construction workforce will be 300 with an operational workforce of 200. Construction is scheduled to commence in 2013 with full production by 2016.	IAS available.	Possible overlapping operational phase with the proposed project	15 km to the north-east of the EIS study area. Within Isaac River sub catchment.
Eagle Downs Coal Mine Expansion - Aquila	Greenfield underground mine to produce 7 mtpa. Construction workforce will be 360 and operational workforce will be 570. Workforce to be accommodated at accommodation facilities in and around Moranbah. Construction ongoing since 2010 with full production by 2014.	EIS process completed	Possible overlapping operational phase with the proposed project	39 km to the south-east of the EIS study area May utilise the same transport networks and may locate workers at Moranbah. Located within the Isaac River sub-catchment.
Caval Ridge Coal Mine Project - BMA	Greenfield open-cut mine to produce 5.5 mtpa. Construction workforce will be 1760 with an operational workforce of 500. Remote workforce to be accommodated in single worker facilities. Construction commenced in 2012 with full production by 2014.	EIS process complete.	Possible overlapping operational phase with the proposed project	29 km to the south of the EIS study area. May utilise the same transport networks. Within Isaac River sub-catchment.

Project Proponent	Description	EIS Status	Relationship to Red Hill Mining Lease Project	
			Timing	Location
Daunia Coal Mine Project - BMA	Greenfield open-cut mine to produce 4.5 mtpa. Construction workforce will be 1000 with an operational workforce of 450. Remote workforce to be accommodated in the Coppabella Accommodation Village. Construction commenced in 2009 with full production by 2013.	EIS process completed	Possible overlapping operational phase with the proposed project	36 km to the south-east of the EIS study area May utilise the same transport networks. Within Isaac River sub-catchment.
Millennium Coal Mine - Peabody	Expansion of an existing open-cut coal mine from 2 to 5.5 mtpa. Construction workforce of 627 with an additional operational workforce of 160. Accommodation for both construction and operational workforces to be at the Coppabella work camp on a remote workforce basis. Construction commenced in 2012 with full production by 2015.	EIS completed	Possible overlapping operational phase with the proposed project	30 km to the south-east of the EIS study area May utilise the same transport networks. Within Isaac River sub-catchment.
Moranbah South Project – Anglo Coal and Exxaro Australia Pty Ltd.	Greenfield undergrounds mine to produce 18 mtpa. Construction to commence in 2014, with first longwall production in 2017.	IAS released	Possible overlapping operational phase with the proposed project	28 km to the south of the EIS study area May utilise the same transport networks. Within Isaac River sub-catchment.
Goonyella to Abbot Point Rail Project – BHP Billiton	Construction of new rail line from GRM to Abbot Point Coal Terminal north of Bowen. Construction workforce of 2,000 and an operational workforce of 500.	EIS and project deferred	Possible overlapping operational phase with the proposed project	Southern end is adjacent to GRM and 0.8 km from the EIS study area.
Goonyella to Abbot Point Rail Expansion Project – Aurizon	70 km long stretch of new rail, linking the Goonyella system to the Newlands system. Construction completed in June 2012.	EIS Complete	Possible overlapping operational phase with the proposed project	Southern end is adjacent to GRM and 0.7 km from the EIS study area
Bowen Gas Pipeline – Arrow Energy	Construction of an approximate 580 km of pipelines and associated infrastructure, which will convey coal seam gas (CSG). Construction to commence in 2016 with first gas to Gladstone in 2017. Construction workforce of 693,	EIS completed	Possible overlapping operational phase with the proposed project	Runs to the east of the EIS study area at a distance of 3 km at its closest point.

Project Proponent	Description	EIS Status	Relationship to Red Hill Mining Lease Project	
			Timing	Location
	commissioning and decommissioning workforce of 10, and operations workforce of 15.			
Bowen Gas project – Arrow Energy	Development of approximately 7,000 CSG production wells over an approximate 35 to 40 year life Much of the gas produced by the Bowen Gas Project will be piped to the proposed Curtis Island LNG Plant	EIS Public Notification	Possible overlapping construction and operational phase with the proposed project	CSG infrastructure to extend north to south from Glenden to Blackwater covering part of the EIS study area.

5.3.1 Infrastructure

The BRM panel extensions, located on MLA 70421, will not require the construction of additional infrastructure.

The RHM underground expansion option is proposed to be located partly on the existing ML 1763 and on the mining lease conversion sought for exploration tenure (MLA 70421).

Infrastructure and plant associated with the RHM will be located on ML 1763, ML 1764, ML 1900 and MLA 70421.

The Red Hill Mining Lease is located adjacent to the existing GRB complex. Substantial existing infrastructure exists to support the existing operations.

There are likely to be significant synergies including opportunities to utilise existing or already approved infrastructure including for example infrastructure and facilities for management of water and waste, supporting infrastructure such as quarries, power and communications infrastructure.

Third-party operated power lines, substations, water supply infrastructure, and communications infrastructure may also be used.

The Proponent will work with the relevant Regional Councils, State government departments, land owners, government-owned corporations and community groups to identify potential impacts on existing external infrastructure, to develop solutions to minimise potential impacts.

5.3.2 Traffic and transport

The GRB mine complex is serviced by an Aurizon rail network. The Goonyella system transports coal from two existing rail loops located on the west of the mine complex to the existing Hay Point Coal Terminal for shipping. Aurizon has also recently completed a rail connection from Goonyella to Abbot Point where there is an existing coal export terminal.

The Hay Point Coal Terminal is located approximately 40 km south of Mackay and commenced operations in the 1970s. The Hay Point Coal Terminal is owned and operated by BMA. The terminal has a capacity of approximately 44 mtpa. BMA has approval to increase capacity up to 55 mtpa and construction works have recently commenced.

The Abbot Point Coal Terminal is located approximately 25 km north of Bowen on the Central Queensland Coast. In May 2010, BHP Billiton was awarded preferred developer status by North Queensland Bulk Ports Corporation Limited for a 60 mtpa facility (Terminal 2).

It is not proposed to export coal from the site by road, except in exceptional circumstances.

Access to the Red Hill MIA, mine entrance and Red Hill accommodation village will be via Red Hill Road. Access to the Red Hill CHPP will be through the main GRB mine complex site entrance off Goonyella Road.

It is expected that construction and operation traffic will access the site from the Peak Downs Highway, via the Goonyella Road (BMA owned) and Red Hill Road.

It is anticipated that at the start and end of rostered periods, the majority of staff will transit through Moranbah Airport, however in order to present a worst case scenario in terms of road usage, the traffic impact assessment will assume that 75 per cent will transit through Moranbah Airport and 25 per cent will transit through Mackay. Workers will be transported via bus from the airport to the mine site and between the Red Hill accommodation village and EIS study area at the start and end of each shift.

5.3.3 Community amenities

The EIS will include a Social Impact Assessment (SIA) which will integrate with existing project mitigations and commitments in the region.

The Plan will include details of the existing community infrastructure, including the social amenities and community services that may be affected by the RHM underground expansion option.

The SIA will not include assessment of the proposed BRM panel extensions, as the existing BRM workforce will complete the work associated with the extension and no additional infrastructure is proposed.

5.4 Land use and tenures

5.4.1 Key local and regional land uses

The Project is located in the Bowen Basin, an area that extends over 60,000 square kilometres, from Collinsville to Theodore, in Central Queensland.

The Red Hill Mining Lease is located approximately 20 kilometres north of Moranbah and 220 kilometres south-west by road from Mackay. Mackay is the main urban and administrative hub for the Mackay, Whitsundays and Isaac Region. Mackay is located on the coast, approximately 20 kilometres north of Hay Point and a 2.5 hour drive from Moranbah via the Peak Downs Highway. Moranbah is the closest town to *the Project* and includes a number of regionally important land use activities and facilities such as an airport, which serves nearby centres including Coppabella, Nebo, Dysart, Clermont and Middlesbrough as well as accommodation villages for non-resident workers. These centres and accommodation villages are within a one to two hour driving distance from Moranbah and service the coal mining and agricultural sectors of the Bowen Basin.

The populations and proximity to communities within the region are briefly described in **Table 5**.

Table 5 - Regional Centres

Town	Population	Non-Resident Worker Population	Separation Distance	Direction from Project
Moranbah	8,511	2,931	20km	South
Coppabella	624	1,438	40 km	South-East
Nebo	342	801	73 km	East

Town	Population	Non-Resident Worker Population	Separation Distance	Direction from Project
Dysart	3,447	1,480	100 km	South-South-East
Clermont	1,948	347	124 km	South-West
Middlemount	2,249	1,431	139 km	South-East
Mackay	78,214	N/A	141 km	East-North-East

Since European settlement, the region has been used predominantly for primary production, particularly for cattle grazing. Grazing activity still occurs to the east and west of the EIS study area on native and buffel grass pastures. Cropping activities were also common in some parts of the region, but were, and remain, concentrated around only some of the alluvial floodplains of the Isaac River and associated tributaries. There is no evidence of previous cropping activity within the EIS study area.

Over the last 40 years, traditional agricultural activities have been replaced in parts of the Bowen Basin with large open-cut and underground coal mining operations, with coal mining and ancillary activities are undertaken to the north and south of the EIS study area.

These mines are serviced by the Goonyella Branch Line operated by Aurizon. The Goonyella Branch Line joins the Blair Athol and Peak Downs Lines en-route to Hay Point. These rail connections were established to service their respective coal mines and transport product for export.

The urban centres located within the Bowen Basin and close to the mines have grown with the level of activity of the nearby mines. Moranbah in particular is a mining town. It was created in 1969 to service the new mines established at Goonyella and Peak Downs. Early amenities in the town included the civic centre, school and hospital, followed by a high school and church. The town now supports a wide range of community and recreational facilities. Residential, commercial, industrial development is also present in the other smaller towns that service the area.

Areas of nature conservation and forestry land uses are also present within the region, and are described in greater detail below.

The EP Act and its subordinate legislation *Environmental Protection Regulation 2008* (EP Regulation), places environmentally sensitive areas (ESA) into two different categories; Category A and Category B.

A search was carried out to determine whether there were any Category A and Category B ESAs within or adjoining the EIS study area and within a 50 kilometre and 100 kilometre radius of the site. Search results indicate that there are no Category A ESAs within the EIS study area or within a 50 kilometre radius of the EIS study area boundary. A number of Category B ESAs have been identified within a 50 and 100 kilometre radius of *the Project* and will be highlighted in the Terrestrial ecology assessment.

A search was carried out to identify any regional ecosystem (RE) community ESAs within or close to *the Project*. The searches revealed there are a number of RE ESAs within and surrounding the EIS study area.

5.4.2 Key local and regional land tenures

New mining leases are required to allow for the development of the RHM, which is currently outside of the existing mine lease area.

The locations of the proposed exploration and mining tenements are shown on **Figure 7**. Details of the EPCs and MDLs are set out in **Table 3**.

There are two EPP's, one PL resource tenement and two PPL's held within the EIS study area.

Mining lease application (MLA) 70421 is overlapped by EPP1103. Under the MR Act, a mining lease applicant is obliged to make reasonable attempts to reach agreement with holders of applicable petroleum tenures in relation to its proposed development. Failing agreement, a mining lease applicant may use the statutory process to request the Minister to make a 'preference decision' about whether the coal resource should be developed in preference to the potential petroleum resources.

Two PPL have been identified traversing the EIS study area:

- PPL89 (granted 2003) held by North Queensland Pipeline No 1 Pty Ltd which runs to the west of the EIS study area.
- PPL83 (non-current) held by Stanwell Corporation Limited which runs through the eastern portion of the EIS study area.

PPL89 connects Arrow Bowen Basin production facility north of Moranbah to Townsville. PPL83 is a designated gas pipeline corridor; however this pipeline has not been developed.

5.4.3 Native title

Native title is the recognition by the Commonwealth and State Governments of the laws, rights and interests over land and water possessed by Indigenous people in Australia, under their traditional laws and customs.

A search of the Department of State Development, Infrastructure and Planning (DSDIP) (formerly Department of Employment, Economic Development and Innovation (DEEDI)) online Interactive Resource and Tenure Maps (IRTM) Database identified two active native title claims within or adjoining the EIS study area (January 2012).

These are listed below in **Table 6**.

Table 6 - Native Title Claims

Interested Party	Claim & Federal Court No.	Status	Area (ha)	Local Government Region
Barada Barna People	QC08/11 QUD380/08	Active	1,438,000	<ul style="list-style-type: none"> • Isaac Regional Council • Mackay Regional Council • Whitsunday Regional Council
Wiri People Core Country Claim	QC06/14 QUD372/06	Active	1,644,000	<ul style="list-style-type: none"> • Central Highlands Regional Council • Isaac Regional Council • Mackay Regional Council

BMA has undertaken negotiations with relevant native title groups in relation to the grant of a mining lease over the claim area.

5.5 Planning instruments, government policies

5.5.1 Statutory land use planning

The proposed mining activity is located within ML1763 and MLA70421 granted under the MR Act. In Queensland all aspects of development of a mining activity for which an EA (mining activity) applies are exempt from the *Sustainable Planning Act 2009* (SP Act) and therefore are exempt from assessment under the local authority planning scheme in accordance with:

- Schedule 4 Table 5 of the Sustainable Planning Regulation 2009 (SP Regulation) where mining and petroleum activities (as defined under the MR Act) are determined to be development that cannot be declared to be development of a particular type and are therefore exempt from assessment from a planning scheme.
- Section 319 of the MR Act, which states, *'the Planning Act does not apply to development authorised under this Act'*.

Despite these exemptions, an assessment will be undertaken of State, regional and local planning provisions pertaining to the proposed mining activity as is anticipated to be required by The Coordinator Generals terms of reference (TOR). The assessment will be undertaken to determine compliance with the local and regional planning instruments including SPPs in order to gain an understanding of the local planning considerations, identify land use planning issues and ensure *'the Project'* is consistent with the local government's intention for the area.

BMA will submit development applications to the applicable agency for any off-lease activities. The development applications will be supported by this EIS and other information required to be provided in order to make the applicable development application 'properly made'.

5.5.1.1 Sustainable Planning Act

The principal land use planning legislation in Queensland is the SP Act. The SP Act seeks to achieve sustainable planning outcomes through:

- managing the process by which development takes place;
- managing the effects of development on the environment;
- continuing the coordination and integration of local, regional and state planning;

The SP Act emphasises the coordination and integration of planning at the 3 levels at which it occurs in Queensland, namely:

- local (government) planning;
- regional planning;
- state planning.

Coordination of planning refers to the linking of planning activities within differing levels of government and the linking of different aspects of planning such as natural resource planning, land use planning and infrastructure planning. Integration refers to the combination and rationalisation of planning outcomes and presenting them in an integrated and logical fashion.

Under the SP Act, state land use planning policy is implemented through state planning instruments, comprising:

- state planning regulatory provisions (such as supporting the regional planning process and providing for infrastructure charge mechanisms);
- SPPs;
- regional plans (including The Sustainable Futures Framework for Queensland Mining Towns, and Mackay, Isaac and Whitsunday Regional Plan that includes *the Project*);

- standard planning scheme provisions (that will become evident in the form and content of planning schemes prepared since the advent of the SP Act in December 2009).

5.5.1.2 State planning regulatory provisions

The State Planning Regulatory Provisions (SPRP) are planning instruments that the planning minister can introduce as required for specific issues and are generally used to:

- implement a regional plan;
- implement structure plans for master planned areas;
- allow the planning minister to respond to environmental, cultural, economic or social issues in local areas by affecting the operation of planning schemes;
- apply state infrastructure charges within master planned areas.

There are no SPRPs that directly relate to *the Project*.

5.5.1.3 State planning policies

A number of SPPs and associated guidelines have been developed and support the implementation of the provisions of SP Act.

SPPs hold statutory weight and establish state government's requirements regarding planning and development matters.

Relevant SPPs which will be assessed as part of the EIS are as follows:

- State Planning Policy 1/92 – Development and the Conservation of Agricultural Land.
- State Planning Policy 1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide.
- SPP 2/07 Protection of Extractive Resources.
- State Planning Policy 3/11 Coastal Protection.
- State Planning Policy 4/11 Protecting Wetlands of High Ecological Significance in Great Barrier Reef Catchments.
- Coal Plan 2030.

5.5.1.4 Regional planning instruments

5.5.1.4.1 Mackay, Isaac and Whitsunday Regional Plan

The Mackay, Isaac and Whitsunday Regional Plan (MIWRP) were issued in February 2012 and replace the non-statutory Whitsunday Hinterland and Mackay Regional Plan. The MIWRP was developed under the SP Act and is supported by the Mackay, Isaac and Whitsunday State Planning Regulatory Provisions 2012.

The plan will guide future planning decisions for the region over the next two decades. It provides a framework to guide the long term sustainability of the region's communities, strengthen its economy, inform the delivery of social services and infrastructure, and protect its environment.

The plan recognises that the resources sector operates within specific legislation and supports the development of mining projects within the region. The plan also identifies that the Bowen Basin as Australia's largest coal deposit and one of the nation's largest coal producers, with coal mining being the major industry in the region and the largest employer.

The plan establishes a vision and direction for the region to 2031. It provides certainty about where the region is heading and provides a framework to respond to challenges and opportunities

that may arise. The regional plan outlines ten desired regional outcomes, supported by a range of policies and programs:

- sustainability, climate change and natural hazards;
- regional landscapes;
- environment;
- natural resource management;
- strong communities;
- strong economy;
- managing growth;
- urban form;
- infrastructure;
- transport.

The following principles contained within the MIWRP are considered relevant in the assessment of this project:

- Northern Economic Triangle.
- Sustainable Futures Framework for Queensland Mining Towns.

5.5.1.5 Local planning instruments

The Project is wholly located within the Isaac Regional Council (IRC) Local Government Area (LGA). The IRC was formed after the amalgamation of the Belyando, Broadsound and Nebo Shires in March 2008.

The majority of *the Project* is within the Belyando Shire area; however a small section protrudes into the Nebo Shire area (approximately 395 hectares on Lot 3 on GV504 along the eastern boundary of the EIS study area). The lands within the EIS study area are zoned for 'rural use' under both planning schemes.

A compatibility assessment of *the Project* to the Belyando Shire and Nebo Shire Planning Schemes will be undertaken even though *the Project* is a mining project located on a mining tenement. At this stage, BMA does not envisage any off-lease development requirements.

If off-lease infrastructure or other facilities are required in association with any component of *the Project*, BMA will submit development applications to the Isaac Regional Council for any off-lease activities requiring council approval, such as quarries, roads, power, and water.

The EIS study area is located within Rural Zones in both planning schemes.

5.5.1.6 Moranbah Urban Development Area Draft Structure Plan

On 30 July 2010, the Moranbah Urban Development Area (UDA) was declared. Economic Development Queensland (EDQ) is working with the Isaac Regional Council and State government agencies to prepare a development scheme for the Moranbah UDA and secure long-term growth areas for the town. Development in the UDA is controlled by the EDQ, and more specifically the provisions of the Moranbah UDA Draft Structure Plan 2010 and the Moranbah Interim Land Use Plan.

The UDA will be assessed as part of *the Project* SIA.

6 Potential impacts of the Project

6.1 Natural environment

6.1.1 Surface water

The potential impacts of *the Project* on surface water resources include:

- disturbance to waterbodies and creeks through subsidence;
- runoff from disturbed areas such as MIAs and stockpiles impacting on downstream water quality and quantity;
- mine-affected water from processing and underground mining.

The EIS will include an assessment of the following:

- The relevant legislation for surface water management;
- assessment methodologies for water quality characterisation, flooding, geomorphology and water management;
- baseline (existing) surface water environment and associated environmental values;
- assessment of the proposed project to identify and evaluate potential impacts on the surface water regime;
- proposed mitigation measures.

As the MIA is within the Isaac River floodplain, flood protection will be required. The current design includes a levee to be constructed along the western bank of the Isaac River to protect the MIA, stockpiles and drift entrance from flooding.

This will provide protection of the MIA and underground mining area in floods up to the predicted Q1000 flood event. Flood mitigation options will be further assessed in detailed design.

Mitigation strategies will be implemented to reduce potential impacts on surface water flows and quality. These strategies will be developed as part of the EIS and may include the diversion of creeks around and through areas of subsidence to provide conveyance of clean water flows downstream.

6.1.2 Groundwater

Groundwater occurs in the unconsolidated and consolidated alluvial and sedimentary rocks within and adjacent to the project area.

Existing information characterises groundwater quality as brackish to saline and this is not expected to change through the operation of *the Project*.

There are seven registered groundwater supply bores within 10 kilometres of the project area. 4 of which are used for stock watering (beef cattle) and domestic purposes, with the remaining bores used either for monitoring purposes, or for the exploration of coal seam gas.

The key activities during the development, operation and closure of the proposed underground mine that have the potential to affect groundwater resources, by potentially altering groundwater flow patterns and causing drawdown of ground water levels are:

- pre-drainage of IMG;
- progressive underground mine dewatering;
- disturbance to strata around mining areas.

The nature and extent of the groundwater resources and its use in the area will be assessed as part of the EIS. The installation of piezometers, groundwater monitoring and groundwater modelling will be used to model the current groundwater environment and to assist in the prediction of local and regional impacts.

The EIS will also include an assessment of the impacts of subsidence on groundwater, and mining dewatering on groundwater users. As part of this process the EIS will also present appropriate mitigation measures to address potential groundwater impacts.

6.1.3 Flora and fauna

The most common modification across the project area has been the removal of the shrub and ground layers and replacement with pasture grass species and effects of cattle grazing.

EPBC Act threatened ecological communities: Natural grasslands of the Queensland Central Highlands and the northern Fitzroy Basin and Brigalow (*Acacia harpophylla* dominant and co-dominant) are present on the site.

The EIS will further assess the potential impacts to terrestrial and aquatic fauna from *the Project* including ground disturbance for mine infrastructure, subsidence impacts on habitat and watercourses.

The EIS will also present appropriate mitigation measures to address terrestrial and aquatic fauna impacts.

6.1.4 Cultural heritage values

As part of the EIS, assessment of the Aboriginal cultural heritage values of the project site will be undertaken in consultation with the Barada Barna people, Wiri Core Country People and Wiri #2 cultural heritage groups.

Cultural heritage management plans will be prepared jointly with relevant Aboriginal parties to address survey and monitoring requirements and mitigation of impacts and management of cultural heritage material during the construction and operation of the mining activity.

The EIS will also survey and evaluate the significance of any non-Indigenous heritage sites that may be present within the project site.

6.2 Amenity

6.2.1 Air quality

The anticipated dust sources from *the Project* during operation are minor and are not expected to impact on any receptors in the vicinity of the study area however they are likely to include some heavy mining equipment movements and coal handling and processing.

The EIS will investigate a range of air quality issues and will identify potential receptors. A predictive air quality model will be developed to support the impact assessment process.

6.2.2 Greenhouse gases

The EIS will estimate the quantity of greenhouse gases (including direct and indirect emissions) attributable to *the Project*.

This information will be used to assess mitigation strategies in the EIS and to provide an appropriate context for actions that are being undertaken by BMA.

6.2.3 Noise and vibration

Noise and vibration sources from *the Project* will include mining (vehicle movements and underground mining equipment) and processing activities (CHPP, conveyors, crushers, screens, loading) and gas drainage.

The level of noise at a given sensitive receptor will vary depending on the operation, type and design of machinery in use and traffic volume in the area.

In 2009 and 2011, background noise levels and ambient vibration were monitored at locations within and adjacent to the project area. Receptors include isolated homesteads and cottages, some of which are owned or managed by BMA or BMC.

Receptors will be confirmed during the EIS process. A predictive noise model will be developed to support the impact assessment process.

This information will be used in the development of appropriate mitigation strategies to reduce noise and vibration impacts from *the Project* as part of the EIS.

6.2.4 Infrastructure

The RHM underground expansion option will generate subsidence of the current landform which may impact existing infrastructure within the project site.

This infrastructure includes:

- GRB mine complex 66 kV powerlines and 132 kV sub station.
- Powerlink Moranbah to Newlands 132 kV Powerline.
- Sunwater Eungella Water Pipeline.

Further investigations into potential infrastructure interactions will occur during the EIS with mitigation strategies being established to reduce the potential impacts on existing infrastructure.

This may include relocation of infrastructure to areas of no or minimal subsidence.

6.2.5 Visual amenity

The regional and local landscape surrounding the project site is considered to be generally representative of the Bowen Basin region.

The regional and local landscapes contain a number of different landscape character types that provide an ever-changing visual environment.

Mining is the predominant activity within the region and as such, facilities and activities associated with this use are visible. With exception to the presence of grazing land, human elements within the landscape, such as roads and townships, are relatively sparsely located and have developed primarily to support the mining operations.

Sealed roads vary in quality and width and provide an integral network between mine sites, townships and rail lines.

Infrastructure associated with the RHM underground expansion option that may have adverse impacts on the visual amenity include but are not limited to the new MIA, CHPP, overhead power lines, the workforce accommodation village, bridge over the Isaac River, conveyors, IMG drainage infrastructure, rail load out infrastructure and supporting administration buildings.

The EIS will present an assessment of the potential impacts that these features may have on the existing landscape and proposed mitigation measures.

6.3 Social environment

The extension of the existing BRM into MLA70421 is to sustain existing production rates of the mine. This will be completed by the existing BRM workforce. No new infrastructure is proposed. The extensions are not anticipated to impact on the existing social environment.

The EIS will address the potential for social impacts and present mitigation strategies to manage any potentially adverse impacts associated with the RHM underground expansion option.

The social impact assessment (SIA) to be undertaken for the RHM underground expansion option will include:

- a summary of the existing social and cultural environment, including adjacent property landholders and local and regional community values;
- identification and discussion of the potential positive and beneficial impacts associated with RHM based on this existing social and cultural baseline;
- proposed strategies to minimise impacts to social values of the local and regional communities while maximising the opportunities from RHM expansion option, including RHM specific and BMA wide approaches.

The assessment will include positive or negative changes in one or more of five broad areas in accordance with the Queensland Government Guidelines for undertaking social impact assessment:

- demographic (e.g. changes in gender or age distributions, the number of resident versus non-resident workers);
- economic (e.g. local employment and business opportunities and economic conditions, availability and affordability of housing);
- health and wellbeing (e.g. social, economic, lifestyle and behaviours, access to services);
- environmental (e.g. dust, noise, lighting and water-quality impacts on social amenity/liveability and health and wellbeing);
- institutional (e.g. capacity, capability and membership of community organisations and governance mechanisms).

6.4 Economic effects

The area surrounding *the Project* supports mining, gas and agricultural activities. The Moranbah community will be the community potentially subject to the greatest level of influence associated with the RHM underground expansion option.

Potential impacts and benefits will also be experienced at wider regional levels such as the IRC LGA and the Mackay, Isaac and Whitsunday Region.

The key activities associated with the RHM underground expansion option may result in changes to the socio-economic environment. The potential impacts and opportunities to enhance the benefits of *the Project* will be identified during the EIS process.

The proposed RHM underground expansion option has the potential to:

- boost employment opportunities within the region and include skill development opportunities;
- boost the state and national economies;
- increase the tax and royalties revenue for both the state and federal governments over the life of *the Project*;
- create opportunities to diversify rural and regional economies in a manner that will help sustain their long-term viability, including providing financial contributions towards social infrastructure improvements within the region;
- generate further local economic spending through the purchase of local resources, goods and services during the implementation of *the Project*, and extending over the life of *the Project*.

To ensure these issues are well understood, stakeholders, including community members, will be consulted as part of the EIS process. This process is discussed further in Section 10.

6.5 Built environment

The extension of the existing BRM into MLA70421 is to sustain existing production rates of the mine. This will be completed by the existing BRM workforce.

No new infrastructure is proposed. The extensions are not anticipated to impact on the existing built environment.

The potential project impacts on the built environment associated with the proposed RHM underground expansion option activities include the following:

- construction of a Mine Industrial Area, CHPP and conveyor;
- gas drainage and ventilation infrastructure;
- a road connecting the accommodation facility to Red Hill Road;
- a bridge across the Isaac River for all-weather access which will be located above the main drive/headings, and will also provide a crossing point for other mine related infrastructure including power supply, water and gas pipelines;
- a proposed levee bank along the west side of the Isaac River to protect the mine access and MIA from flooding;
- an accommodation village.

Product coal from the Project will likely be transported by train to the existing Port of Hay Point using existing rail infrastructure. As (and when) production increases export may also occur through alternate facilities to the Port of Hay Point.

The coal will then be loaded into dry bulk carriers for shipment to markets, primarily in Asia.

6.6 Matters of National Environmental Significance and EPBC Act

Baseline environmental assessments of the Red Hill Mining Lease study area were compiled by URS in 2011. The assessments mapped vegetation communities including EPBC listed threatened ecological communities (TECs) and species, as well as matters identified as conservation significant under Queensland legislation.

Baseline data was taken from a range of Federal and State databases as well as drawing on ecological studies undertaken in the vicinity of *the Project* and GRB mine complex since 1998.

Relevant EPBC matters have been synthesised from the above mentioned surveys and draft reports and are presented below. The presence of a species/community is described as 'known', 'likely' or 'possible' as outlined below.

Table 7 - Threatened ecological communities (TEC's)

Threatened Community	EPBC Act Status	Site Presence	Corresponding Regional Ecosystem (Res)
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Known	Endangered REs: 11.3.1, 11.4.7, 11.4.8, 11.4.9, 11.5.16 and 11.9.1
Natural grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	Endangered	Known	Of concern RE 11.8.11

The grassland RE mapped by URS is a heterogeneous polygon comprised of 70% RE 11.8.11, *Dichanthium sericeum* grassland on Cainozoic igneous rocks, and 30% non-remnant modified Grassland.

Table 8 - Threatened flora species

Common Name	Scientific Name	EPBC Act Status	Site Presence
Bluegrass	<i>Dichanthium setosum</i>	Vulnerable	Known
Finger panic grass	<i>Digitaria porrecta</i>	Endangered	Likely
King bluegrass	<i>Dichanthium queenslandicum</i>	Vulnerable	Likely

Table 9 - Threatened fauna species

Common Name	Scientific Name	EPBC Act Status	Site Presence
Red goshawk	<i>Erythrorhynchus radiatus</i>	Vulnerable	Likely
Squatter pigeon, (southern subspecies)	<i>Geophaps scripta scripta</i>	Vulnerable	Known
Star finch (eastern and southern)	<i>Neochmia ruficauda ruficauda</i>	Endangered	Likely
Black-throated finch (southern)	<i>Poephila cincta cincta</i>	Endangered	Likely
Australian painted snipe	<i>Rostratula australis</i>	Vulnerable	Possible
Eastern long-eared bat (south-eastern form)	<i>Nyctophilus timoriensis</i>	Vulnerable	Possible
Northern quoll	<i>Dasyurus hallucatus</i>	Endangered	Likely
Koala	<i>Phascolarctos cinereus</i>	Vulnerable	Possible
Fitzroy River turtle	<i>Rheodytes leukops</i>	Vulnerable	Possible
Ornamental snake	<i>Denisonia maculata</i>	Vulnerable	Known
Yakka skink	<i>Egernia rugosa</i>	Vulnerable	Likely
Brigalow scaly-foot	<i>Paradelma orientalis</i>	Vulnerable	Possible

Potential impacts to listed threatened species and ecological communities include:

- direct clearing for the mine entry (drift), MIA, CHPP, accommodation village and incidental mine gas management infrastructure;
- disturbance to habitat from noise, light and general activity;
- effects of subsidence.

7 Environmental management and mitigation measures

7.1 Natural environment – management and mitigation

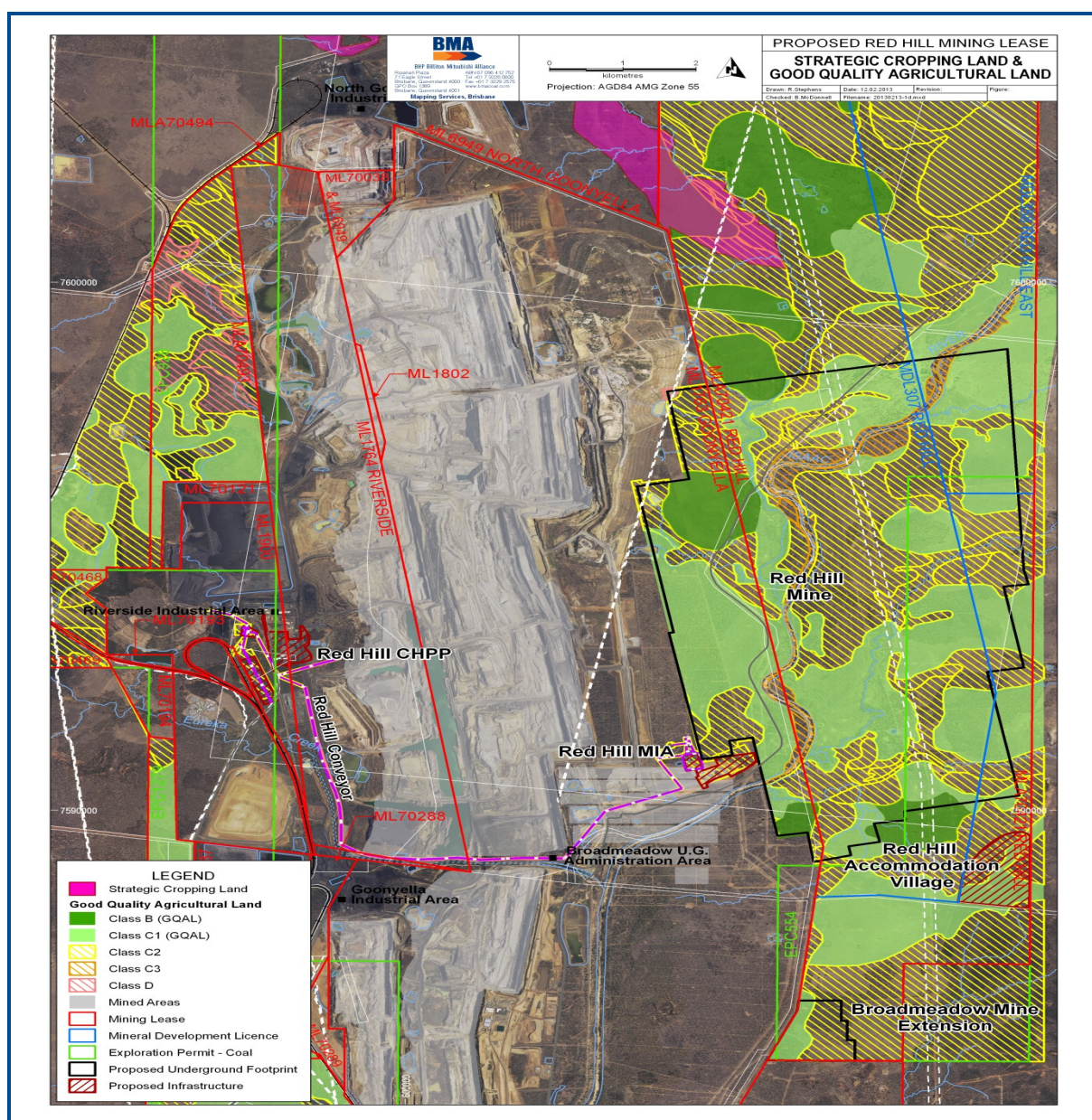
7.1.1 Land resources

Preliminary investigations indicate that State-mapped Strategic Cropping Land (SCL) as well as Good Quality Agricultural Land (GQAL) is located within *the Project* and/or ML area. This is illustrated in **Figure 8**.

Further assessments will be undertaken throughout the EIS to determine the potential impact on SCL.

The EIS will assess the impacts of *the Project* on existing land resources, including a search of the Environmental Management Register and Contaminated Land Register and will present any relevant mitigation measures that may be required.

Figure 8 - Strategic Cropping Land & Good Quality Agricultural Land



7.1.1.1 Water management

Key aspects of the mine water management system for *the Project* are described below:

- Raw water needs will be supplied from the BMA regional water allocation and transported via BMA's raw water pipeline network.
- Groundwater intercepted at RHM will be transferred to existing mine water storage at the GRB mine complex.
- Mine water runoff from the RHM MIA will be contained in the MIA dam prior to being transferred to existing mine water storage at the GRB mine complex.
- The majority of water demands for the processing of RHM coal will be supplied from the GRB mine water inventory, with a small portion requiring a raw water source.

The proposed RHM does not propose any controlled mine water release from the RHM mine water facilities. RHM mine waters will be contained to prescribed containment performance criteria at the RHM MIA and transferred to mine water storage at the GRB mine complex.

The interface between the RHM and GRB mine water management networks is expected to provide greater efficiency, maximise the opportunity for mine water reuse, ensure mine water releases are managed holistically and reduce water related risks.

GRB mine complex will assume responsibility for the management of all mine water generated by *the Project* once it is transferred to existing water storage, in accordance with the GRB mine complex EA.

The Broadmeadow extension is not expected to generate significant additional mine water. Water from BRM underground operations will continue to be managed through the existing BRM infrastructure.

Water will be recovered from mine dewatering and IMG management and transferred to the GRB mine water management network for re-use. The CHPP will also feature water recovery through dewatering of tailings/rejects.

A small proportion of water requirements for the proposed Red Hill CHPP must be supplied with raw water. The remainder will be supplied from the GRB mine water or raw water depending on site water inventories. Potable water is also required for amenities, underground mine use and to top-up mine water in low rainfall periods.

The Project demand for raw water will vary from year to year. At peak production, minimum requirements are expected to be around 900 ML/year, but may increase if mine water is not available from the GRB mine complex for input into the Red Hill CHPP.

An additional tie-in to the Eungella pipeline will be constructed in the vicinity of the Red Hill MIA. No additional allocations are sought for *the Project*.

The water from mine water dams will be used to satisfy site water demands, including dust suppression and a proportion of demand from the CHPP.

Raw water from BMA surface water allocations will be piped to the project site to supply clean water including the water requirements of the CHPP and longwall mining equipment as well as supplement site water demands as required.

7.1.2 Waterway management

The Project is located within the headwaters of the Isaac-Connors sub-catchment, of the greater Fitzroy Basin. The RHM underground expansion option spans across the Isaac River and tributary catchments of Goonyella Creek and 12 Mile Gully.

Other tributaries in the area include Eureka Creek, Fisher Creek, and Platypus Creek, all of which flow into the Isaac River downstream of the proposed RHM.

The Isaac River and tributaries in and around the project study area are ephemeral. Base flow appears to be sustained by surface base flow stores rather than distinct groundwater contribution. It is typically limited to a few days up to approximately less than one or two weeks after surface runoff (quick flow) has drained from contributing sub-catchments.

As part of the proposed RHM underground expansion option, sections of these creeks would need to be managed to reduce the impact of subsidence on the creeks' physical and biological environments as well as the impact on flows to downstream users. Approvals including but not limited to those required under the *Water Act 2000* will be sought as required.

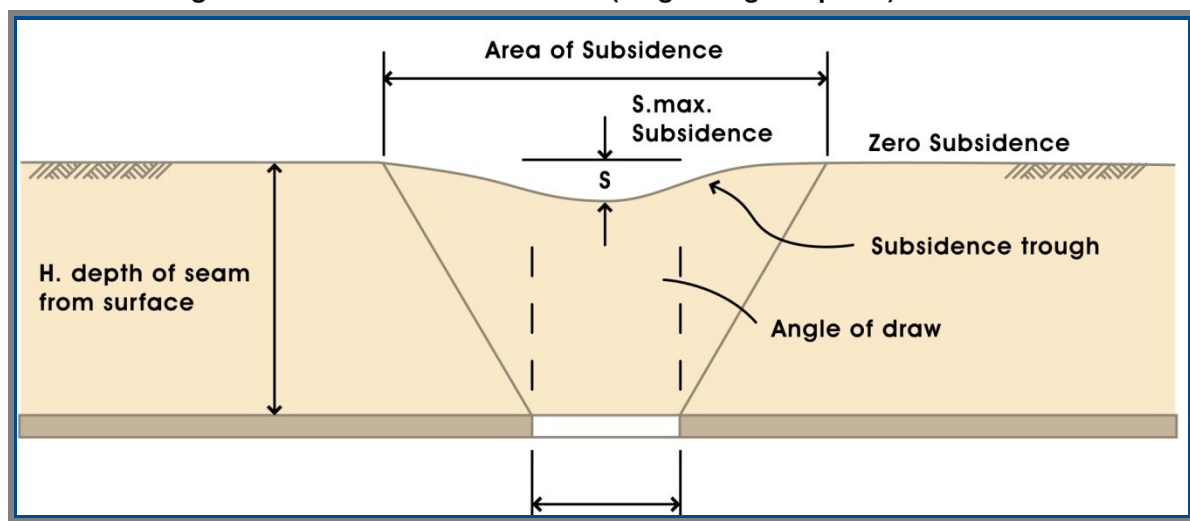
7.1.3 Subsidence

As mining progresses, the unsupported strata or goaf, progressively collapse into the mined void.

With time the overlying stratum compacts down into the collapsed area resulting in a lowering of the ground surface.

This is referred to as subsidence and is illustrated in **Figure 9**.

Figure 9 - Overview of Subsidence (single longwall panel) Schematic



The Project will model a worst-case scenario in relation to subsidence. The degree of subsidence is expected to be largely affected by the geology of the mined strata.

As the mine footprint moves from west to east the coal seam becomes deeper, therefore, the subsidence at the surface is likely to be less in the eastern part of the footprint than the west.

7.1.4 Groundwater

Groundwater occurs in the unconsolidated and consolidated alluvial and sedimentary rocks within and adjacent to the project area.

Existing information characterises groundwater quality at RHM as brackish to saline and this is not expected to change through the operation of the mine.

There are seven registered groundwater supply bores within 10 kilometres of the project area. 4 of which are used for stock watering (beef cattle) and domestic purposes, with the remaining bores used either for monitoring purposes, or for the exploration of coal seam gas.

The key activities during the development, operation and closure of *the Project* components that have the potential to affect groundwater resources, by potentially altering groundwater flow patterns and causing drawdown of ground water levels are:

- pre-drainage of IMG;
- progressive underground mine dewatering;
- disturbance to strata around mining areas.

The nature and extent of the groundwater resources and its use in the area will be assessed as part of the EIS. The installation of piezometers, groundwater monitoring and groundwater modelling will be used to model the current groundwater environment and to assist in the prediction of local and regional impacts.

The EIS will also include an assessment of the impacts of subsidence on groundwater, and mining dewatering on groundwater users. As part of this process the EIS will also present appropriate mitigation measures to address potential groundwater impacts.

7.1.5 Flora

The project area is part of the Brigalow Belt North Bioregion. Floristic surveys of the project study area have been carried out between 2002 and 2011 within and adjacent to the project boundaries.

The ecological values of the project area are typical for the northern Bowen Basin with large areas of land historically cleared for grazing. Although some areas of remnant vegetation remain, most have been modified to some extent by historical and current land management practices.

The most common modification across the project area has been the removal of the shrub and ground layers and replacement with pasture grass species and effects of cattle grazing.

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) threatened ecological communities: Natural grasslands of the Queensland Central Highlands and the northern Fitzroy Basin and Brigalow (*Acacia harpophylla* dominant and co-dominant) are present on the site.

The flora surveys also identified a total of 20 regional ecosystems, including five listed as endangered, 8 of concern, and 7 least concern under Queensland vegetation management legislation.

In addition to the regional ecosystems and threatened ecological communities, literature reviews have identified seven species of conservation significance as potentially occurring in the study area.

Of these, field surveys undertaken to date have confirmed the presence of 2:

- *Dichanthium setosum* (bluegrass) - listed as near threatened under the *Nature Conservation Act 1992 (NC Act)* and vulnerable under the *EPBC Act*.
- *Cerbera dumicola*, which is listed as near threatened under the *NC Act*.

The conservation significant *Dichanthium queenslandicum* (king bluegrass) and *Digitaria porrecta* (finger panic grass), were identified as being potentially present given the types of habitat available on site, but have not been recorded on site.

In addition to the conservation significant vegetation ecosystems, communities and species on the site, there have also been 46 exotic species identified. 5 of these species were identified as being of management concern; *Eriocereus martinii* (harrisia cactus), *Parthenium hysterophorus* (parthenium), *Sporobolus fertilis* (giant Parramatta grass), *Opuntia stricta* var. *stricta* (prickly pear) and *Opuntia tomentosa* (velvety tree pear).

These species are currently declared as Class 2 pest species under the *Land Protection (Pest and Stock Route Management) Act 2002* and *Parthenium hysterophorus* (parthenium) is also listed as a Weed of National Significance.

The EIS will further assess the nature and extent of the terrestrial and aquatic flora and vegetation communities within the project area, along with an assessment of the potential impacts from the proposed project.

The EIS will also present appropriate mitigation measures to address terrestrial and aquatic flora impacts.

7.1.6 Fauna

Fauna surveys of the project area have been carried out between 1998 and 2011. The aim of the fauna surveys was to document the terrestrial vertebrate fauna and habitat, with particular reference to the occurrence of conservation significant fauna and to undertake assessment of potential impacts to the fauna as a result of *the Project*.

In addition to comprehensive literature reviews, systematic fauna surveys were conducted using methods including trapping, systematic searches, animal call recording and incidental sighting.

The results of the literature reviews and field surveys identified 16 fauna species listed under the *EPBC Act* and/or the *NC Act* that are known to occur within the project area. This includes three threatened and 8 migratory/marine bird species, two reptile and three mammal species.

The literature reviews also identified the potential presence of a further six conservation significant species. The 3 threatened species that were identified during the surveys include the ornamental snake (*Denisonia maculata*), squatter pigeon (*Geophaps scripta scripta*) and koala (*Phascolarctos cinereus*).

The EIS will further assess the potential impacts to terrestrial and aquatic fauna from *the Project* including ground disturbance for mine infrastructure, subsidence impacts on habitat and watercourses.

The EIS will also present appropriate mitigation measures to address terrestrial and aquatic fauna impacts.

7.1.7 Air quality

Air quality in the region is mainly influenced by pastoral activities, open-cut mining, and nearby rail and road transportation activities. Receptors include isolated homesteads and cottages, some of which are owned or managed by BMA or BHP Billiton Mitsui Coal Pty Ltd (BMC). Receptors will be confirmed during the EIS.

The potential dust sources during construction of the RHM underground expansion option will include earthworks and increased traffic movements.

The anticipated dust sources during operation are minor and are not expected to impact on any receptors in the vicinity of the study area however they are likely to include some heavy mining equipment movements and coal handling and processing.

The EIS will investigate a range of air quality issues and will identify potential receptors. A predictive air quality model will be developed to support the impact assessment process.

7.1.8 Greenhouse gases

The EIS will estimate the quantity of greenhouse gases (including direct and indirect emissions) attributable to *the Project*.

This information will be used to assess mitigation strategies in the EIS and to provide an appropriate context for actions that are being undertaken by BMA.

7.1.9 Noise and vibration

The BRM underground mine panel extensions will not contribute to additional noise or vibration impacts at any sensitive receptor location.

Noise and vibration sources from the RHM underground expansion option will include mining (vehicle movements and underground mining equipment) and processing activities (CHPP, conveyors, crushers, screens, loading) and gas drainage.

The level of noise at a given sensitive receptor will vary depending on the operation, type and design of machinery in use and traffic volume in the area.

In 2009 and 2011, background noise levels and ambient vibration were monitored at locations within and adjacent to the project study area. Receptors include isolated homesteads and cottages, some of which are owned or managed by BMA or BMC.

Receptors will be confirmed during the EIS process. A predictive noise model will be developed to support the impact assessment process.

This information will be used in the development of appropriate mitigation strategies to reduce noise and vibration impacts.

7.1.10 Decommissioning

In consultation with relevant stakeholders, BMA will review all infrastructure assets towards the close of *the Project* and assess which structures will be retained, sold for recycling, relocated or disposed of as general or regulated waste.

Recycling and re-use of redundant infrastructure, by using local contractors will be promoted by BMA.

Mine rehabilitation will be achieved through the creation of rehabilitation success criteria and monitoring requirements under *the Projects* EA.

7.1.11 Final rehabilitation

The rehabilitation objectives to be achieved for *the Project* are as follows:

- Achievement of acceptable post-disturbance land use suitability – mining and rehabilitation should aim to create a landform with land use capability and/or suitability compatible with the land use pre-mining, unless other beneficial land uses are pre-determined and agreed.
- Creation of stable post-disturbance landform – disturbed land and subsided areas will be rehabilitated to a condition that is self-sustaining or a condition where maintenance requirements are consistent with an agreed post-mining land use. Water storages retained on the lease should be safe, self-sustaining and be acceptable for the post mining land uses.
- Preservation of downstream water quality – water quality of surface and ground waters that leave the mining leases should be adequate to maintain environmental values and beneficial uses downstream of the proposed EIS study area.

The rehabilitation concept that is currently envisaged for the RHM consists of:

- A sustainable post mining land use of grazing on a mosaic of:
 - Pasture;
 - remnant and replanted native vegetation;
 - ponded areas.
- a riparian corridor along the Isaac River that is retained and enhanced;

- retention and enhancement of native grassland in the north-west of the underground mine footprint;

The full details of and methodology for post mining rehabilitation will be provided as part of the EIS.

7.2 Built environment

The Project will generate subsidence of the current landform which may impact existing infrastructure within the project site.

This infrastructure includes:

- GRB mine complex 66 kV powerlines and 132 kV sub station.
- Powerlink Moranbah to Newlands 132 kV Powerline.
- Sunwater Eungella Water Pipeline.

Further investigations into potential infrastructure interactions will occur during the EIS with mitigation strategies being established to reduce the potential impacts on existing infrastructure.

This may include relocation of infrastructure to areas of no or minimal subsidence.

7.2.1 Gas drainage and management

Underground mining will require the construction of infrastructure to drain and manage IMG to enable the safe and efficient mining of coal. An IMG hazard management strategy will be developed to reduce the associated risks.

This will include:

- pre-drainage of certain coal measures prior to underground mining (using surface to in-seam and underground in-seam methane);
- dilution of methane through mine ventilation during underground mining, known as ventilation air methane (VAM);
- post-drainage using goaf drainage bore holes (goaf gas);
- post-drainage using underground cross-measure drilling.

The impacts associated with gas drainage will include vegetation clearing to enable access, and for the construction and operation of of gas drainage and water management infrastructure.

7.2.2 Run of mine and raw coal conveyor

A new conveyor system will transfer coal from the proposed RHM underground expansion option portal to a new CHPP located adjacent to the Riverside CHPP. A second new conveyor will transfer coal from the CHPP to product stockpiles and then to the train load-out.

7.2.3 Tailings and coarse reject management

The rejects materials from the CHPP will consist of the following:

- dense medium coarse reject material;
- reflux classifier reject material;
- de-watered flotation tailings material.

Tailings and coarse rejects will be dewatered and transferred by truck or conveyor and disposed of in in-pit spoil within the GRB mine complex under the existing EA.

7.2.4 Portable water treatment

A portable water system will be provided around the CHPP area and will service the site offices and workshops. Portable water will be supplied from a small portable water treatment plant at the CHPP.

Effluent from the water treatment plant will be managed via the mine affected water management system.

7.2.5 Inter-relationship with the existing GRB Mine Complex

While the proposed development will be operated as an independent mine, the proposed RHM underground expansion option will interface with the existing GRB mine complex in the following areas:

- Water for processing coal will be sourced from the GRB mine complex and mine water generated from the RHM underground expansion option will be transferred to the GRB mine complex water management network. This interface will provide greater efficiency, maximise reuse, ensure mine water releases are managed holistically and reduce water related risks.
- CHPP and stockpile facilities will be co-located with the existing Riverside Mine coal handling facilities.
- Waste from coal processing will be dewatered and disposed of in in-pit spoil in accordance with the GRB mine complex EA.
- Some external road upgrades may also be required. The works would be carried out in consultation with Isaac Regional Council.

7.3 Social environment

The extension of the existing BRM into MLA70421 is to sustain existing production rates of the mine. This will be completed by the existing BRM workforce. No new infrastructure is proposed. The extensions are not anticipated to impact on the existing social environment. The SIA will therefore not include the assessment of the proposed extension to BRM.

A SIA will be developed for the RHM underground expansion option.

The key objectives of the SIA are to:

- Present a clear summary of the potential positive and negative social impacts, as well as proposed mitigation and management strategies and implementation actions.
- Reflect the key findings and recommendations of the social impact assessment, including the results of engagement with stakeholders.
- Promote an active and ongoing role for communities, local authorities and government.

BMA is committed to the communities in which it operates. In 2012, BMA invested around \$38 million across the Bowen Basin townships to support local services and community development programs. In Moranbah, BMA's financial contribution alone was approximately \$15 million, and included:

- \$1.4 million for a range of company community support programs such as day care, additional sporting and recreational facilities, education and cultural initiatives.
- \$13.3 million (including \$4.6M towards special rates and charges) for local infrastructure support for water, road and airport maintenance. BMA supplies and funds more than 80 per cent of Moranbah's water including \$7.9m in-kind water supply to Moranbah during FY12.

Previous commitments from BMA include the 2011 Moranbah Community Support Package and airport upgrade.

BMA will seek to align social impact mitigations with existing programs being carried out by BMA in the communities in which it operates.

7.4 Cultural heritage management plan (indigenous)

As part of the EIS, assessment of the Aboriginal cultural heritage values of the project area will be undertaken in consultation with the Barada Barna people, Wiri Core Country People and Wiri #2 cultural heritage groups.

Cultural heritage management plans will be prepared jointly with relevant Aboriginal parties to address survey and monitoring requirements and mitigation of impacts and management of cultural heritage material during the construction and operation of the mining activity.

7.5 Non-indigenous cultural heritage plan

The EIS will also survey and evaluate the significance of any non-Indigenous heritage sites that may be present within the project site.

7.6 Greenhouse gas management plan

The greenhouse gas (GHG) assessment of the RHM underground component will consider the following:

- annual global and national GHG emissions;
- international and national policy in regards to GHG emissions;
- direct and indirect sources of GHG emissions from the development and operation of the mine;
- proposed GHG reduction measures.

The GHG assessment will consider emissions from the following existing and proposed operations:

- existing operations at GRM and BRM;
- Proposed operations:
 - mining within mining lease (ML) 1763 and mining lease application (MLA) 70421 associated with the RHM underground component;
 - mining within MLA70421 associated with the extension of the existing BRM;
 - transport of the RHM remote workforce.

7.7 Waste management

The RHM underground expansion option will include the generation of general commercial and industrial waste products.

These wastes may include:

- vegetation cleared from ground disturbance areas;
- regulated waste (hydrocarbon waste, detergents, solvents, batteries and tyres);
- general waste (food scraps, paper, rags, cans and glass);
- scrap metal and off-cuts from maintenance activities and from the construction of the CHPP, MIA and supporting infrastructure;
- sewage effluent and sludge.

A Waste Management Plan will be prepared. This will ensure that all wastes are managed appropriately during the construction, operation and decommissioning phases. Integration with the adjoining operations at GRB will be undertaken where ever possible.

The preferred waste management hierarchy will align with existing approved site management practices and form the basis of a framework for prioritising waste management practices to achieve an acceptable environmental outcome on site in accordance with *Waste Reduction and Recycling Act 2011* (WRR Act).

7.8 Hazard, risk, health and safety

Aspects of the RHM underground expansion option which may be associated with hazards to the health and safety of the workforce or the community or to the environment occur in all 3 phases as described below.

These aspects will be assessed as part of the EIS.

7.8.1 Construction phase

The key activities of the construction phase which may be considered a health and safety risk are:

- transport of personnel, equipment and materials to and from site (including air travel);
- transport, storage and use of dangerous goods on site;
- construction of surface and underground infrastructure;
- clearing vegetation, stripping and removal of soil;
- equipment maintenance;
- plant and equipment commissioning;
- construction of mine buildings, accommodation facilities and infrastructure;
- water, waste, chemical and oil handling, storage and management activities;
- drilling and blasting for mine access;
- construction or upgrading of waste water treatment plants and potable water treatment plants
- transport of regulated waste off site;
- installation of IMG management infrastructure.

7.8.2 Operational phase

The key activities of the operational phase which may be considered a health and safety risk are:

- transport of mine personnel, equipment and materials to and from site (including air travel);
- transport, storage and use of dangerous goods on site;
- equipment maintenance;
- coal removal using underground longwall mining;
- coal handling, stockpiling and preparation;
- subsidence of land surface;
- water management, including water storages;
- IMG management, flaring, storage and transport;
- goaf gas infrastructure installation and goaf gas removal;
- rejects and dewatered tailings disposal;

- sewage treatment;
- remote workforce impacts on local services, such as doctors, hospitals, ambulances, medicine supplies;
- subsidence adaptive management, such as erosion control and rehabilitation earthworks.

7.8.3 Decommissioning phase

Once mining operations have completed the planned coal extraction, the mine and associated infrastructure will be decommissioned. The surface may require minor earthworks to achieve the final desired landform and the disturbed area revegetated as discussed in **Section 7.1.11**.

Activities undertaken during this phase, which may be considered a health and safety risk, will include:

- ensuring final landforms and agreed structures are safe;
- reshaping subsidence depressions (where required) to achieve the final agreed landform;
- applying agreed rehabilitation measures such as shaping, top soiling and revegetating remaining areas;
- decommissioning and removing mine infrastructure from the site, including conveyors, coal handling and preparation plant (CHPP) equipment and structures, coal load-out systems, an on site gas fired power station (if constructed) and IMG pipelines, and potable water and sewage pipelines;
- IMG management – removal of surface infrastructure including the backfilling of holes, final revegetation of drill pads, access tracks and utility corridors.

Negotiations will be undertaken with government and landholders at the time to determine which infrastructure will remain and which infrastructure will be decommissioned and removed.

7.9 Environmental management

The EIS will describe the measures that will be undertaken to prevent or mitigate any potential adverse impacts on the environment, including impacts on water resources (surface water and groundwater), land resources, air quality (including greenhouse gases), noise and vibration, cultural heritage (including indigenous and non-indigenous), and flora and fauna of conservation significance.

Environmental management requirements for *the Project* will be stipulated in the regulatory documents that are prepared as part of the approvals process prior to mining.

The environmental management requirements will cover:

- Environmental values likely to be affected by mining activities.
- Potential adverse and beneficial impacts of the mining activities on the environmental values.
- Environmental protection objectives.
- Control strategies adopted to achieve the environmental protection objectives.
- Proposed EA conditions.
- Measurable performance criteria (outcomes) for each element of the operation.
- Control measures that will be implemented to achieve the performance criteria.
- The monitoring requirements to measure actual performance and effectiveness of control measures.

- Auditing requirements to demonstrate implementation of agreed construction and operation environmental management strategies and compliance with agreed performance criteria.
- Format, timing and responsibility for reporting and auditing of monitoring results.
- Procedures for complaints and inquiries.
- Corrective action procedures - the action to be implemented in case a performance requirement is not reached and the person(s) responsible for action (including staff authority and responsibility management structure).
- Roles and responsibilities in relation to environmental management, monitoring and corrective actions.
- Requirements for training and competence of workers.

An application for an EA for *the Project* will need to be made under the *EP Act*.

8 Approvals required for the Project

The Project will be subject to a MLA process pursuant to *the MR Act*. *The Project* activities will be authorised by an EA granted under the *EP Act*. *The Project* will involve on-lease development.

For development on the ML, a number of approval exemptions will apply including:

- Exemptions from the SP Act as per Part 8, Section 319 of the *MR Act*.
- Exemptions from assessment against local government planning schemes as per Table 5, Schedule 4 of the *SP Regulation*.
- An exemption from the *Vegetation Management Act 1999* for clearing native vegetation in accordance with Schedule 24, Part 1, Item 1(6), of the *SP Regulation*.

BMA will work closely with the IRC throughout the planning and development phase for the RHM underground expansion option to ensure that benefits to the region are maximised and potentially adverse impacts are prevented or mitigated. The EIS will consider relevant IRC policies and planning schemes.

The Commonwealth, State, and local government approval requirements that may be relevant to *the Project* are summarised in **Table 10**.

The following key policies and guidelines will also be considered as part of the EIS process:

- Australian Government EPBC Act Environmental Offsets Policy Consultation Draft, August 2011.
- Ecoaccess Guideline - Planning for Noise Control Guideline 2004.
- *Environmental Protection (Air) Policy 2008*.
- *Environmental Protection (Noise) Policy 2008*.
- *Environmental Protection (Water) Policy 2009*.
- Major Resource Projects Housing Policy: Core principles to guide social impact assessment, August 2011.
- Manual for Assessing Hazard Categories and Hydraulic Performance of Dams. February 2012.
- Queensland Biodiversity Offsets Policy (DERM, 2011).
- Queensland Government Environmental Offsets Policy EPA, 2008.
- Queensland Government Policy for Vegetation Management Offsets Version 3, September 2011.
- Queensland Government Water Regulation 2000 Moratorium Notice 14 December 2010 for groundwater in the Fitzroy Basin.
- Queensland Water Quality Guidelines, Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000.
- Social Impact Assessment Guideline to Preparing a Social Management Plan, September 2010.
- State Planning Policy 1/92 Development and the Conservation of Good Quality Agricultural Land.
- State Planning Policy 1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide.
- State Planning Policy 1/12 Protection of Queensland's Strategic Cropping Land.

Compliance with the Native Title Act 1993 is required for the creation of rights such as mining leases and other mining rights over land where native title may exist.

The right to negotiate process is required for several areas affected by *the Project* and an agreement was entered into between BMA and the Barada Barna people consenting to the grant of the mining lease for RHM.

Additional surface rights are not required for the existing GRB MLs, and no activities are proposed for areas where surface rights are not held. On that basis, no native title issues should arise.

Table 10 - Potential Statutory Approvals

Legislation	Relevant Authority	Relevance to Project
Commonwealth Legislative Requirements		
EPBC Act	SEWPaC	Approval required to carry out a 'controlled action' and to authorise the environmental impacts of <i>the Project</i> on matters of national environmental significance
Native Title Act 1993	Commonwealth Attorney General	Compliance with this Act is required over land where native title may exist. The right to negotiate process is required for granting mining lease applications.
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	SEWPaC	This Act allows for the protection of significant Aboriginal areas and objects declared as such under the Act. The Act also requires the discovery of Aboriginal remains to be reported to the relevant minister for heritage.
Queensland Legislative Requirements		
SDPWO Act	Department of State Development Infrastructure and Planning (DSDIP)	BMA is seeking declaration of <i>the Project</i> as a 'Coordinated Project' and has prepared this IAS in support of this application. BMA will follow the EIS process set out by the SDPWO Act.
EP Act	Department of Environment and Heritage Protection (DEHP)	Environmental approval and management of mining activities predominantly falls under the EP Act. On completion of the EIS process under the SDPWO Act and issue of an EA (mining lease) will be required for the proposed mine. Some additional approvals may be required in relation to movement of contaminated soils.
MR Act	DEHP Department of Natural Resources and Mines (DNRM)	BMA has applied for one ML for <i>the Project</i> activities (MLA 70241).
SP Act	IRC	The planning and development assessment provisions of the SP Act do not apply to development carried out on a mining lease. Development permits would be required if any project infrastructure and associated development was located off a mining lease or for operational works in relation to dewatering bores. Building approval requirements are triggered by the SP Act.
NC Act	Department of Agriculture, Fisheries and Forestry (DAFF) Department of National Parks, Recreation, Sport and Racing	Interference with species listed under the Nature Conservation (Wildlife) Regulation 1994 requires a permit.
Water Act 2000	DEHP DNRM Department of Energy and Water Supply (DEWS)	The following activities are subject to approval requirements under the Water Act: <ul style="list-style-type: none"> • water course diversions (not including subsidence) • taking and interfering with groundwater • taking or Interfering with surface water • Destroying vegetation, excavating or placing fills in a watercourse.

Legislation	Relevant Authority	Relevance to Project
Aboriginal Cultural Heritage Act 2003 (ACH Act)	DNRM	Agreement and registration of a cultural heritage management plan over the EIS study area.
Queensland Heritage Act 1992	DEHP	Approval is required to enter or interfere with a protected area or item listed on the Queensland Heritage Register.
Transport Infrastructure Act 1994	DTMR	The construction, maintenance, operation or conduct of ancillary works and encroachment on a State Controlled Road requires approval by the Chief Executive of the Department of Transport and Main Roads. This may include traffic management measures associated with large loads or other unusual traffic.
Strategic Cropping Land Act 2011	DAFF DNRM	The Strategic Cropping Land Act 2011 (SCL Act) allows for certain resource activities to apply for a compliance certificate to operate under a standard conditions code.
Vegetation Management Act 1999	DNRM	A development permit may be required to clear native vegetation on land of relevant tenure where that clearance is not subject to any exemptions.
Land Act 1994	DNRM	Approval required for the creation, temporary or permanent closure of roads, stock routes or public utility easements. Permits are required for the occupation of a reserve, road or unallocated state land.
Explosives Act 1999	Department for Police and Community Safety	A licence is required to use, possess, store and transport explosives.
Fire and Rescue Services Act 1990	Fire Service Authority	This Act sets out a number of requirements for buildings and storage of dangerous goods in relation to fire safety. A certificate of compliance is required if a workplace is located more than one floor above ground level.
Land Protection (Pest and Stock Route Management) Act 2002	DAFF	Approval is required for temporary or permanent closure of roads and stock routes where required on-tenure. Management of declared weeds is also required.
Electricity Act 1994	DEWS Relevant electricity entity (e.g. Powerlink or Ergon Energy) Relevant public entity Relevant road authority	Approval / notice may be required for: <ul style="list-style-type: none"> an internal distribution network is constructed and operated to supply electricity generated work likely to come into contact or disturb overhead powerlines, soil or other material supporting or covering the entities work Electricity works if that work is likely to interfere with soil, vegetation, sewer, drain or tunnel, temporarily stop or divert traffic or interfere with a publicly controlled place.
Local Government Act 2009	IRC	Approval will be required where works are to be undertaken on a local government road or reserve.
Transport Operations (Road Use Management) Act 1995	DTMR	Approval is required if a road is temporarily or permanently closed. Approval may also be required for the transportation of dangerous goods.
Plumbing and Drainage Act 2002	IRC	Approval will be required for installation of any on site sewerage systems, toilet and shower facilities.
Building Act 1975	Department of Housing and Public Works	A development permit for building work is required for 'assessable development', where the structure or building work is of a fixed nature (as defined under the <i>Building Act 1975</i>).
Food Act 2006	IRC	A licence is required to carry on a licensable food business. However, a licence will not be required where a third party operates the food business.
Liquor Act 1992	Liquor Licensing Division of Queensland Treasury and Trade	A licence is required to sell liquor. However, a licence will not be required where a third party operates the premises selling liquor.
Coal Mining Safety and Health Act 1999	DNRM	The CSMH Act requires operators of coal mines to undertake a range of measures in relation to risk identification, planning and management to ensure safety of workers.

9 Costs and benefits summary

9.1 Local, state and national economies

An Economic Impact Assessment (EIA) will be submitted with the EIS. An EIA will assess benefits, values and potential impact areas resulting from the construction and operational phases of *the Project*.

The Project will result in substantial economic impacts throughout the region, Queensland and Australia. The major economic impacts of *the Project*, largely associated with the RHM underground expansion option, include:

- the potential total capital investment for the life of the mine (RHM and potential increase in Queensland's Gross State Product per annum over the construction phase based on input-output modelling;
- peak direct employment of around 3,000 full-time equivalents (FTEs), or an average of 653 FTEs per annum, and an additional 4,200 indirect jobs in Queensland, during the construction phase;
- the potential total operating investment over the life of mine, and an increase in Queensland's Gross State Product per annum over the operating life of RHM based on input-output modelling;
- a peak of around 1,500 FTEs, or an average of 875 direct FTEs, and an additional 1,200 indirect jobs in Queensland, during operations;
- coal royalty payments to the Queensland Government. Applying the benefits transfer technique (for all project components);
- an assessment of the annual ecosystem services value.

There are not expected to be any direct costs to government associated with the development of *the Project*. This relates to rail, port and shipping, road, water, energy and accommodation infrastructure.

9.2 Natural and social environments

It is the intention of the EIS process to investigate the possible impacts and define suitable environmental mitigation strategies to be incorporated into management protocols and plans in support of anticipated approvals.

It is the intention of BMA to rigorously implement mitigation strategies as part of the construction and operation of *the Project*, as is already the case for current BMA projects in the region. Where impacts are unavoidable, the intent will be to offset such impacts to land-based and ecological values.

An assessment of the existing social environment and possible impacts associated with the RHM underground expansion option will be submitted in the EIS. Most of the potential social impacts are anticipated to be positive for the area including economic diversification, population diversification, and increased economic, employment and training opportunities.

The social environments will benefit from increased local expenditure in the Moranbah Township and the broader region due to additional expenditure, expenditure by employees (where access is provided to the Moranbah Township) and indirect employment growth where this results in the additional employees moving to Moranbah. Strategies will be developed through the EIS process to avoid or mitigate against social impacts.

10 Community and stakeholder consultation

A Stakeholder Engagement and Communications Plan will be developed for *the Project*.

BMA intends to work with and maintain open communication with the stakeholders on all aspects of *the Project*.

Key objectives of this plan will be to:

- initiate and maintain open communication with the stakeholders on all aspects of *the Project*;
- identify community issues and concerns in relation to *the Project*;
- target specific stakeholders to help identify potential social impacts and develop appropriate mitigation strategies;
- proactively respond to and work with the stakeholders to develop appropriate solutions and strategies to minimise negative impacts associated with *the Project*;
- address stakeholder issues through the EIS process and communications;
- continue the long-term relationship between BMA and the stakeholders that is based on mutual trust and respect;
- provide feedback to the stakeholders about their issues and concerns and how their feedback has been used;
- manage a process, which uses existing stakeholder contact points and avenues for discussion.

To achieve the objectives outlined in the plan, the stakeholder engagement process will involve:

- planning for and implementing opportunities for the stakeholders to comment on the potential impacts of *the Project*;
- establishing flexible and mobile display and support facilities that maximise stakeholder involvement;
- recognising the contribution BMA makes in the economic development of the region;
- obtaining, considering, managing and documenting stakeholder comments and issues of concern;
- building on information developed by BMA during the planning process for *the Project*.

BMA will undertake formal public consultation with the stakeholders as part of the EIS process.

11 References and data sources

11.1 References

BM Alliance (BMA) (2011), *Sustainable Development covering Health, Safety, Environmental and Community performance*, BMA accessed online on 2 August 2012 at:
<http://www.bhpbilliton.com/home/aboutus/sustainability/reports/Pages/Roll%20up%20Pages/2011-BHP-Billiton-Sustainability-Report.aspx>.

Office of Economic and Statistical Research (OESR) (2012), *Mining and Petroleum Royalties*, OESR. Accessed online on 2 August 2012 at: <http://www.osr.qld.gov.au/royalties/statistics.shtml>

12 Glossary, acronyms and abbreviations

The following abbreviations have been used in this document:

BMA	BM Alliance Coal Operations Pty Ltd
BMC	BHP Mitsui Coal Pty Ltd
BRM	Broadmeadow Mine
CHPP	Coal Handling and Preparation Plant
CQCA	Central Queensland Coal Associates
DAFF	Department of Agriculture, Fisheries and Forestry
DEHP	Department of Environment and Heritage Protection
DEWS	Department of Energy and Water Supply
DNRM	Department of Natural Resources and Mines
DSDIP	Department of State Development, Infrastructure and Planning
DTMR	Department of Transport and Main Roads
EA	Environmental Authority
EIS	Environmental Impact Statement
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EP Act	<i>Environmental Protection Act 1994</i>
EPC	Exploration Permit (Coal)
EPP	Exploration Permit for Petroleum
GMS	Goonyella Middle Seam
GRB	Goonyella Riverside and Broadmeadow Mines
IAS	Initial Advice Statement
IMG	Incidental mine gas
IRC	Isaac Regional Council
LGA	Local Government Area
MIA	Mine Industrial Area
MLA	Mining Lease Application issued pursuant to the <i>Mineral Resources Act 1989</i>
MI	Mega litres
ML	Mining Lease issued pursuant to the <i>Mineral Resources Act 1989</i>
MR Act	<i>Mineral Resources Act 1989</i>
mtpa	million tonnes per annum
NC Act	<i>Nature Conservation Act 1992</i>
PL	Petroleum Lease issued pursuant to the <i>Petroleum and Gas (Production and Safety) Act 2004</i>
PPL	Petroleum Pipeline Licence
RHM	Red Hill Mine
SCL	Strategic Cropping Land
SDPWO Act	<i>State Development and Public Works Organisation Act 1971</i>

SEWPAC	Department of Sustainability, Environment, Water, Population and Communities
SIA	Social Impact Assessment
SP Act	<i>Sustainable Planning Act 2009</i>
tph	tonnes per hour
TSM	Thick Seam Mining
WRR Act	<i>Waste Reduction and Recycling Act 2011</i>

13 Contact details

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