Caval Ridge Mine
Change Request 5
Rail Alignment Changes

October 2011

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Background

The Caval Ridge Mine is a proposed new coal mine and coal handling and processing facility, located approximately 15 kilometres south of Moranbah and 160 kilometres south west of Mackay. BM Alliance Coal Operations Pty Ltd (BMA) as manager and agent for the Central Queensland Coal Associates Joint Venturers is the proponent of the Caval Ridge Mine which forms part of BMA's Bowen Basin Coal Growth Project (BBCGP). The BBCGP was declared by the Coordinator-General in 2008 to be a significant project for which an Environmental Impact Statement (EIS) was required under the State Development and Public Works Organisation Act 1971 (SDPWOA).

Since the finalisation of the Caval Ridge Mine EIS, the Coordinator-General's Report (August 2010) and the assessment and feedback from four previous change requests, as the project feasibility study moves to completion, BMA has continued to review Caval Ridge Mine's construction and operational requirements. As a consequence of the continued review and in accordance with provisions of the SDPWOA, BMA is seeking to make a change to the project description (location of the rail alignment) as described in the Coordinator-General's Evaluation Report for the Caval Ridge Mine. .

Change to rail line alignment

Following ongoing review and project value engineering studies, BMA seeks to realign the proposed Caval Ridge Mine rail line between the existing Blair Athol Line and the Caval Ridge Mine. Product coal will still be railed either to the Port of Hay Point (Hay Point Coal Terminal via the existing Blair Athol Line), or to the Abbot Point Coal Terminal (via the Newlands and North Goonyella system upon completion of the Northern Missing Link Rail).

Reasons for proposed change

Value engineering studies that have been conducted since the EIS was completed have found that a realignment of the rail line will provide a more direct route between the Blair Athol Line and the relocated train load out (TLO) facility, reducing the previously EIS approved rail line by 5 kilometres. The proposed rail alignment does not cross any additional properties to those which were originally traversed. However two properties (Lot 1 RP616897 and Lot 12 SP151669) have been purchased by BMA since the EIS and Supplementary Environmental Impact Statement (SEIS) were prepared. This land acquisition has facilitated the proposed change.

Anticipated environmental effects of the proposed changes

BMA has assessed the potential impacts of the proposed rail line realignment and has concluded that it will not materially change the assessment undertaken within the Caval Ridge Mine EIS / SEIS. However, the realignment will reduce noise impacts upon sensitive receptors as the rail line will be up to 4 kilometres further south of Moranbah. In reducing the linear length of the rail line the impact is reduced accordingly.

Process for evaluation of changes

Part 4, Division 3A of the SDPWOA provides the statutory process for the Coordinator-General to evaluate changes to a declared significant project that has been assessed previously. Under those provisions of the SDPWOA, BMA is requesting that the Coordinator-General approve the Project changes as outlined above.

Conclusion and recommendations

The proposed changes to rail infrastructure allow for a more logical and direct alignment of the rail corridor, reducing cost, noise and disturbed ground impacts. It is recommended that the proposed

changes to the rail line be considered in light of the changing circumstances regarding land ownership and the environmental assessment, and does not deviate substantially from the original project description. It is important to note that the proposed rail alignment does not materially change the project, therefore, is recommended that the Coordinator-General's Conditions do not require amendment.

1 Introduction

This is a formal Change Request (referred to as Change Request 5) to the Coordinator-General for consideration of a change to the Project Site (project change), as defined in the Coordinator-General's Evaluation Report August 2010 for the Caval Ridge Mine (Caval Ridge Mine) (refer Figures 2, 3 and 4). This Change Request is made under Part 4, Division 3A (Section 35C) of the SDPWOA. BMA is the proponent for Caval Ridge Mine.

An EIS prepared by BMA for Caval Ridge Mine was released by the Coordinator-General for public and advisory agency comment during July and August, 2009. The SEIS was prepared to address issues raised during public notification. The Coordinator-General's Report evaluating the EIS and SEIS was released in August 2010.

The Change Request process is a process under the SDPWOA enables a proponent to make project changes to any project declared to be a significant project for which an EIS is required under Section 26 (1) (b) of the SDPWO Act. Project changes are common, as there are often long timeframes between the preparation of the EIS and issue of the Coordinator-General's Report. Over this period of time a number of factors can influence a project including market changes, technical requirements or project feasibility.

An EIS is an assessment of a project at a particular point in time, and ongoing review of construction and operational requirements throughout the approvals phase means BMA must reconsider some aspects of Caval Ridge Mine from those detailed in the Caval Ridge Mine EIS and SEIS.

BMA requests the Coordinator-General's approval for the realignment of the rail line between the existing Blair Athol Line and TLO facility. Product coal will still be railed to either the Port of Hay Point (Hay Point Coal Terminal via existing Blair Athol Line) or to the Abbot Point Coal Terminal (via the Newlands and North Goonyella system upon completion of the Northern Missing Link Rail).

A comprehensive list of relevant conditions and requirements imposed by the Coordinator-General is contained in Appendix A of this Change Request.

Change Request 5 addresses issues raised in the Terms of Reference (ToR) for the BBCGP, the EIS, SEIS and the Coordinator-General's Report for Caval Ridge Mine. As required under Section 35E of the SDPWOA, this Change Request provides the following information for the proposed rail alignment change:

- statutory requirements of the proposed changes;
- reasons for the proposed changes;
- a description of the proposed changes and their effects on the project; and
- environmental effects of the proposed changes and mitigation measures.

This Change Request 5 provides detailed information to allow the Coordinator-General to appropriately evaluate the proposed changes to Caval Ridge Mine (in accordance with Section 35E(c)).

1.1 Project background

1.1.1 Bowen Basin Coal Growth Project

The BBCGP comprises the expansion of BMA's coal mining operations in the northern portion of the Bowen Basin. The BMA BBCGP Initial Advice Statement, provided to the Coordinator-General in

June 2008 outlined the growth in metallurgical coal through the Daunia, Caval Ridge and Goonyella Riverside Mines.

The BBCGP was declared a significant project under the SDPWOA by the Coordinator-General in 2008 and the ToR allowed for the completion of a number of EISs to address the multiple components of the BBCGP, including the Caval Ridge Mine.

The four key components of the BBCGP are:

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

1.1.2 Caval Ridge Mine

Caval Ridge Mine will be a new multi-seam, open cut coal mine in the Bowen Basin. The mine industrial area (MIA) will be approximately 16 kilometres from Moranbah, the site is also dissected by the Peak Downs Highway (Figure 1.1 Caval Ridge Mine Context Plan). The northern most boundary of Caval Ridge Mine is approximately 6 kilometres from the edge of Moranbah. The Caval Ridge Mine site is adjoined by the Peak Downs Highway and is approximately 17 kilometres in length and 4 kilometres in width. The mine is expected to have a working life of 30 years.

The Caval Ridge Mine site is located north of BMA's Peak Downs Mine and covers the northern extent of the BMA Mining Lease (ML1775). A new mining lease (ML70403), immediately to the west of ML1775, will be used for site infrastructure and supporting activities. Caval Ridge Mine is located on both ML1775 and ML70403.

The EIS and SEIS for Caval Ridge Mine have been assessed by the Coordinator-General pursuant to section 35 of the SDPWOA, and recommended the project proceed, subject to the conditions and recommendations contained within the Coordinator-General's Report.

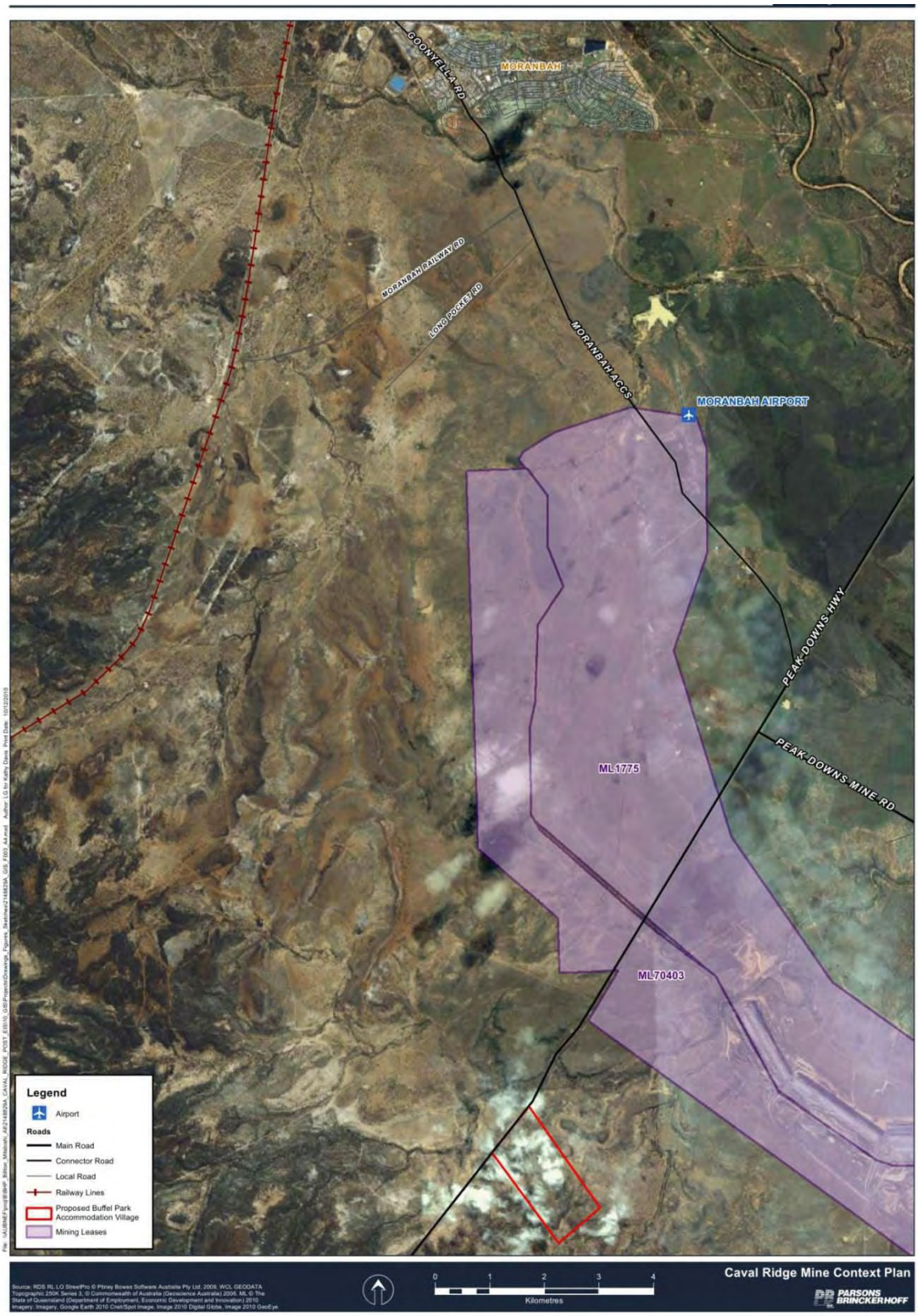

Figure 1.1 Caval Ridge Mine Context Plan

1.2 Previous change requests

Ongoing review of Caval Ridge Mine's construction and operational requirements by BMA has required the preparation and submission four Change Requests (Change Request 1, 2, 3, and 4) to the Coordinator-General. The following table provides an overview of each Change Request.

Table 1-1 Change Request Summary

Change Request Number	Description	Status
Change Request 1	Sought changes to the location and accommodation capacity of Caval Ridge Mine's operational workforce	Approved February 2011
Change Request 2	Sought administrative amendments to conditions relating to the granting of the Caval Ridge Mine Environmental Authority	Approved November 2010
Change Request 3	Sought administrative amendments to conditions relating to the Housing Impact Study	Approved July 2011
Change Request 4	Sought changes to the proposed Operational Workforce arrangements.	Approved September 2011

This request (Change Request 5) will be lodged and assessed separately to Change Requests 1, 2, 3 and 4. Under Section 35G of the SDPWOA, the Coordinator-General will decide if Change Request 5 is to undergo public notification.

2 Statutory requirements

2.1 Assessment of Caval Ridge Mine undertaken to date

This section of the Change Request outlines the existing assessment that has occurred for Caval Ridge Mine to date, to address both Commonwealth and State interests.

2.2 Government

2.2.1 Commonwealth Government

The Commonwealth Minister of Sustainability, Environment, Water, Population and Communities (DSEWPaC) determined on 23 September 2008 that Caval Ridge Mine constituted a controlled action under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA), as there is likely to be a significant impact on matters of national environmental significance.

The completed EIS and SEIS and the Coordinator-General's Report have been referred to the Commonwealth Minister for assessment under the EPBCA. The Commonwealth decision/ approval was made in March 2011.

The variation to accommodation village location, scale and capacity that was included in Change Request 1 was accepted by the Department of Sustainability, Environment, Water, Population and Communities in a letter to the Coordinator-General on 28 October 2010.

Furthermore, the proponent will provide DSEWPaC with the relevant information to inform them of Change Request 5. It has been concluded that the realignment of the rail corridor will not impact Matters of National Environmental Significance (MNES) (refer section 3 of this report for further detail).

2.2.2 State Government

On 4 July 2008, the Coordinator-General declared BMA BBCGP a significant project for which an EIS is required in accordance with Part 4 of SDPWOA.

The ToR for the BMA BBCGP set out a phased process for assessing the environmental impacts of each element of the BMA BBCGP. As discussed earlier, the EIS and SEIS for Caval Ridge Mine have been completed.

The Coordinator-General's Report on the Caval Ridge Mine EIS was issued on 9 August 2010. Approval of a number of change requests have occurred since, which are outlined in Table 1-1.

2.3 Change process for EIS

The process for making changes to approved significant projects is outlined in Section 35B to 35L of the SDPWOA. The SDPWOA requires written, descriptive documentation of the changes with sufficient supporting information to enable the assessment of the effects on the Project. A change made under the SDPWOA does not require a full assessment of the Project against the ToR. Under Section 35E, the level of detail presented as part of the Change Request should be sufficient to ensure that the impacts may be properly considered by the Coordinator-General.

2.4 Legislation

Following the issue of the Coordinator-General's Report on an EIS (or a Change Request), any necessary approvals under other relevant legislation must be sought. This includes the *Sustainable*

Planning Act 2009 (SPA), Mineral Resources Act 1989 (MR Act) or Environmental Authorities under the *Environmental Protection Act 1994* (EP Act).

2.4.1 Sustainable Planning Act 2009

The proposed rail loop alignment will require approval under the *Sustainable Planning Act 2009*. An application for Reconfiguration of a Lot over Lot 1 on RP616897, Lot 16 on SP163605 and Lot 12 on SP151669 will be sought form the Isaac Regional Council to contain the rail spur and loop in its own allotment/corridor. The application will be assessed under the Belyando Planning Scheme 2009 (Planning Scheme).

The land the subject of the application for Reconfiguring a Lot is zoned Rural, and the application for Reconfiguring a Lot is Code Assessable under the Planning Scheme.

The application for Reconfiguring a Lot results in a number of referral triggers to the Department of Transport and Main Roads as well as Powerlink. The proposed reconfiguration is not prohibited development under the *Draft Mackay, Isaac and Whitsunday State Planning Regulatory Provisions 2011* as the subdivision results in lots of 100 hectares or greater within the Regional Landscape and Rural Production Area.

Based on discussions with the Isaac Regional Council, approval of the application for Reconfiguring a Lot will establish an existing rail corridor. For the purpose of Section 1.4(2) of the Planning Scheme (refer extract below), existing includes "...lawfully established after commencement". That is, with establishment of the corridor through the ROL process, the exemption provisions of the Scheme come into effect.

Pursuant to Section 1.4(2)(a)(iv) of the Planning Scheme, development involving railway activities in existing corridors is exempt development. Accordingly, an application for Material Change of Use is not required because of the exemption provided under the Planning Scheme.

Railway activities is defined under the Planning Scheme as meaning premises used for the purpose of planning, construction, maintaining and operating rail infrastructure, facilities and rolling stock, including rail maintenance depots, rail workshops and rail freight centres.

Belyando Planning Scheme Extract – Rail Exemption

1.4 General Assessment Provisions

(1) Area Covered by the Planning Scheme:
- (a) This planning scheme covers the whole of the local government area including roads and "watercourses".
- (b) The provisions of the planning scheme apply to all roads and "watercourses".

(2) Exempt Development
- (a) The following "development" is exempt development within the local government area:
  - (i) "development" that is made exempt pursuant to Schedule 9 of IPA, Sections 5.6.2 and 5.6.3 of IPA[2];
  - (ii) land designated for community infrastructure - exempt development pursuant to IPA[3];
  - (iii) "development" involving the supply of road transport infrastructure in existing[4] roads;
  - (iv) "development" involving "railway activities" in existing rail corridors;
  - (v) "development" involving water cycle management infrastructure, including infrastructure for water supply, sewerage, collecting water, treating water, stream

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[2] Schedule 9, part 3 of IPA lists exempt development that may not be made assessable or self-assessable development under a planning scheme. For further clarification, the following is exempt for the purposes of the planning scheme and is in accordance with Table 4, Items 2 and 6 of Schedule 9 of the Act:
- Operational works that is ancillary works and encroachments that are carried out in accordance with requirements specified by gazette notice by the chief executive under the *Transport Infrastructure Act 1994* (including the excavating and borrowing of material necessary for road making, maintenance or repair) or done as required by a contract entered into with the chief executive under the *Transport Infrastructure Act 1994*, section 47; and
- Operational work (including maintenance or repair work) carried out by or on behalf of a public sector entity authorised under State Law, (e.g. the Council or the Department of Main Roads) to carry out the work.

[3] Section 2.6.5 of IPA.

[4] For the purpose of section 1.4(2) existing means – lawfully existing at *"commencement"* or lawfully established after "commencement".

2.4.2 Mineral Resources Act 1989 and Environmental Protection Act 1994

As per s147 of the *Environmental Protection Act 1994*, a "mining activity" has to be and activity authorised under the *Mineral Resources Act 1989*.

The off lease part of the rail line will not be authorised under the *Mineral Resources Act 1989*. Therefore the EA conditions will not apply to this section of the rail line for construction and operation.

As stated in Section 2.4.1, BMA will obtain all necessary approvals under the *Sustainable Planning Act 2009*, and other applicable legislation, whereby environmental conditions may be imposed to mange construction and operation activities.

2.5 Other matters

2.5.1 Matters of National Environmental Significance (MNES)

An EPBC Act Protected Matters Report and ecological assessment was prepared for the proposed amended rail alignment area (refer Appendix F for further detail).

As a result of the database search and aerial photograph interpretation, it was concluded that threatened ecological communities may occur in the rail alignment area. Results from this analysis indicate that the ecological values presented by the vegetation and habitat potentially impacted by the revised rail corridor do not appear to differ from the original rail spur alignment presented in the EIS and SEIS. Primarily, this vegetation is non-remnant grassland and low/open non-remnant woodland

that is not classified as remnant and is not of legislative conservation significance. Further significant field studies to assess floristic assemblage, fauna habitat values, fauna movement opportunities and ecological integrity were not deemed necessary due to the relatively low ecological values present.

Therefore, it is concluded that it is unlikely that additional MNES will be affected by the proposed rail realignment to those that were identified and assessed in the EIS and SEIS. Furthermore, mitigation and compensatory measures as outlined in the EIS and SEIS are deemed to be applicable and sufficient to manage potential impacts associated with the development and operation of the rail infrastructure.

Section 3.4.5 provides further detail on ecological matters.

2.5.2 Proponent commitments

There are no additional project commitments as part of this Change Request.

2.6 Future requirements

After lodgement of Change Request 5 with the Coordinator-General, the Coordinator-General will decide if the Change Request is to undergo public notification under Section 35G of the SDPWOA.

Subsequent to the evaluation process selected by the Coordinator-General a Change Report must be prepared under Section 35I of the SDPWOA. This change report will evaluate the proposed changes and the subsequent effects on the Project. Under Section 35 (I) of the Act, the Coordinator-General has the ability to approve or refuse the proposed changes. The Coordinator-General may wish to deem the proposed changes as 'approved unconditionally', which would mean the requirements of Section 35I(2) of the SDPWOA may not be required.

3 Proposed rail changes

3.1 Overview

After ongoing review of the construction and operational requirements for the Caval Ridge Mine, BMA seeks to reconsider some aspects of Caval Ridge Mine from those detailed in the Caval Ridge Mine EIS and SEIS.

BMA requests the Coordinator-General's approval for a realignment of the rail line between the existing Blair Athol Line and the TLO facility. Product coal will still be railed either to the Port of Hay Point (Hay Point Coal Terminal via existing Blair Athol Line) or to the Abbot Point Coal Terminal (via the Newlands and North Goonyella system upon completion of the Northern Missing Link Rail).

3.1.1 Initial EIS rail description

The EIS and SEIS identified that product coal will be railed to the Hay Point and Dalrymple Bay coal terminals for distribution to international markets. Opportunity to rail the product coal via Abbot Point Coal Terminal will exist upon completion of the proposed Northern Missing Link Rail Line.

The rail line for Caval Ridge Mine was proposed to be constructed from the existing Blair Athol Line, run in an easterly direction to ML70403, and then run inside the western boundary of ML70403 in a southerly direction to the TLO facility. As shown in Figure 3.1, the approved rail line traverses Lot 1 RP616897, Lot 16 SP163605 and Lot 12 SP151669.

The Coordinator-General's Report includes conditions specifically related to the rail infrastructure (refer Appendix, Schedule 4, Condition 3 (a) and (b)). The rail component is primarily 'off lease' and therefore will be subject to approvals under the *Sustainable Planning Act 2009* (SPA) and other legislation delivered through the Integrated Development Assessment System (IDAS) process. Notwithstanding this, Appendix B of this Change Request identifies the key conditions and recommendations of the Coordinator-General's Report that relate to the environmental impacts associated with the rail line.

It is noted that the Coordinator-General's Report stated that Caval Ridge Mine must be carried out generally in accordance with the EIS (July 2009) and SEIS (November 2009) and Appendices 2-5 of the Coordinator-General's Report, which included the rail line as then aligned. The Coordinator-General's Report also contained conditions and recommendations relating to the environmental impacts associated with the rail line, which are discussed in this Change Request.

The rationale and supporting reasons for this change is provided in the Section 3.3 of this Change Request.

3.2 Description of proposed change

Section 35E(a) of the SDPWOA requires the proponent to describe the proposed changes and their effects on the Project. This section provides the detail of the proposed changes to rail alignment.

BMA has developed an alternative alignment for the rail line between the existing Blair Athol Line and TLO facility. The proposed rail alignment is shown in Figure 3.2 of this Change Request.

The rail spur will exit the Blair Athol Line at the same point as originally proposed in the EIS/SEIS. However, it is proposed to run in a south-easterly direction to the TLO facility on ML70403. The rail loop adjoins the TLO facility. The proposed rail alignment still traverses Lot 1 RP616897, Lot 16 SP163605 and Lot 12 SP151669. Lot 1 RP616897 and Lot 12 SP151669 are now owned by BMA, which was not the case at the time the EIS and SEIS were prepared (refer Figure 3.2).

The relocation of the TLO Facility is not required to be evaluated as part of the request. Although the location of the TLO Facility has moved slightly north, it remains within the project footprint as described by the CG's evaluation report.

The scale and intensity has not changed from the original EIS assessment and the conditions of the CG report will continue to apply. Furthermore, the mitigation and management measures outlined in the EIS and SEIS will continue to apply.

The proposed changes to the rail line are limited to a route which exists outside ML70403. Train movements and frequencies will remain the same as described in the EIS and SEIS. Table 3-1 of this Change Request outlines the key parameters of the proposed rail line in comparison to the approved rail line.

Table 3-1 Technical comparison of EIS and Change Request rail line

Rail line parameter	EIS	Rail Proposed Change	Difference
Total length (km)	17.08 km	12.50 km	- 4.58 km
Corridor width (m)	100.00 m	100.00 m	No difference
Length, outside ML70403 (km)	6.35 km	11.65 km	+ 5.30 km
Length, inside ML70403 (km)	10.74 km	0.08 km	- 10.66 km
Area, outside ML70403 (ha)	62.38 ha	102.58 ha	+ 40.20 ha
Area, inside ML70403 (ha)	93.01 ha	8.49 ha	- 84.52 ha

The area within the EIS rail corridor on the western section of ML70403 (approximately 84.25 ha) will be utilised by other mining infrastructure, The section of the EIS rail corridor which traversed Lot 1 RP616897 and Lot 16 SP163605 will no longer be utilised, and will therefore not be disturbed.

Cut and fill techniques will be implemented to achieve suitable rail gradients. Under rail culverts for surface water drainage and occupational crossings for both stock and equipment movements will be provided. The proposed rail line remains compliant with Queensland Rail (QR) standards and requirements. QR has approved in-principle the proposed change to rail in terms of its horizontal and vertical alignment (refer to copy of QR correspondence in Appendix C).

3.2.1 Comparison of rail change to EIS/SEIS

Both the EIS and SEIS indicated the rail line will be constructed from the Blair Athol Line to Caval Ridge Mine TLO facility. The SEIS did not consider further optimisation of the rail line. Table 3-2 of this Change Request provides an analysis summary of the rail related aspects in the EIS and SEIS, and compares these aspects with the relevant elements of the proposed rail line change.

An environmental assessment of the proposed changes is provided in Section 3.4 of this Change Request. Where necessary, the environmental impacts have been supported by relevant mitigation measures which were outlined in the EIS and SEIS.

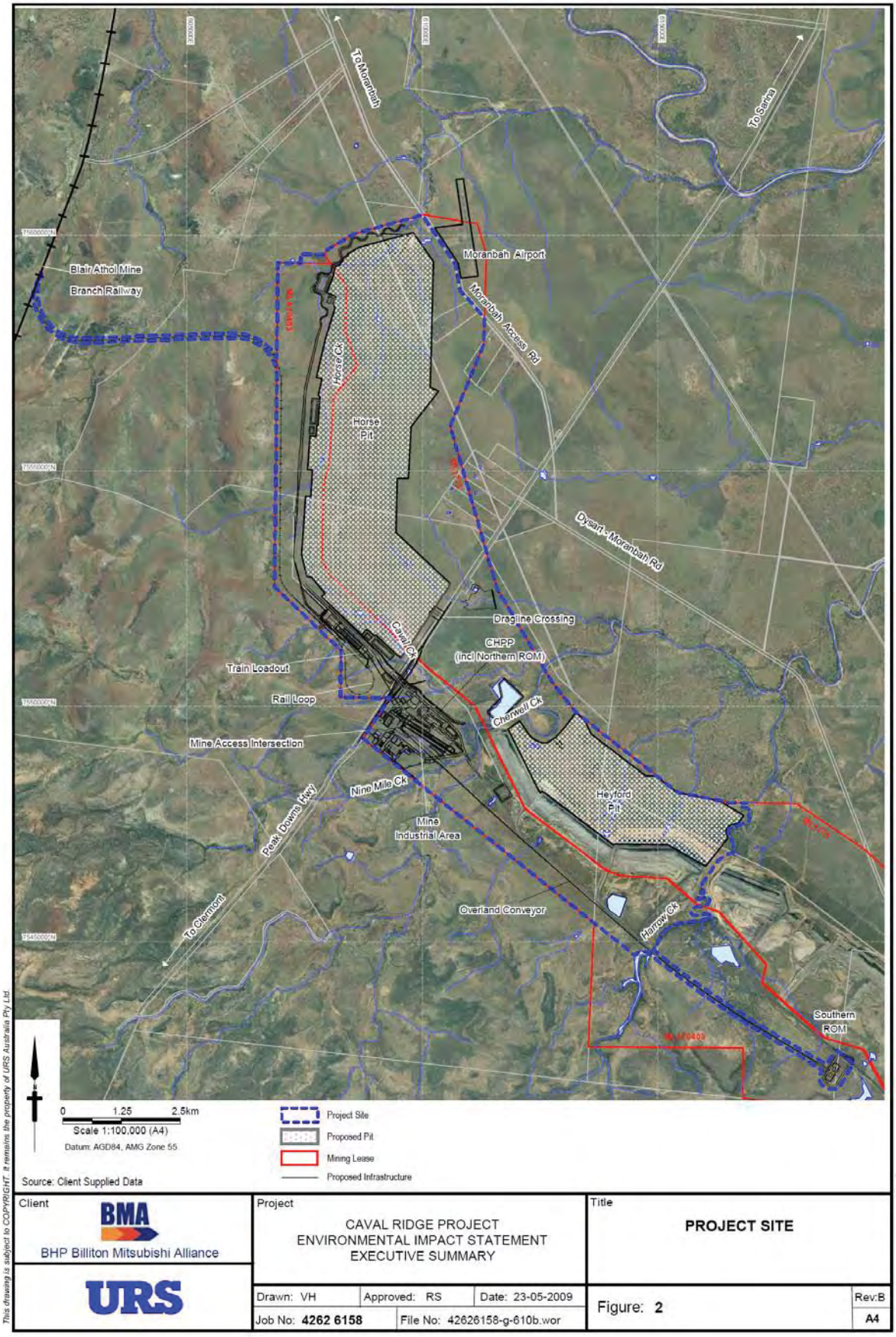


Figure 3.1 Approved rail line for the project

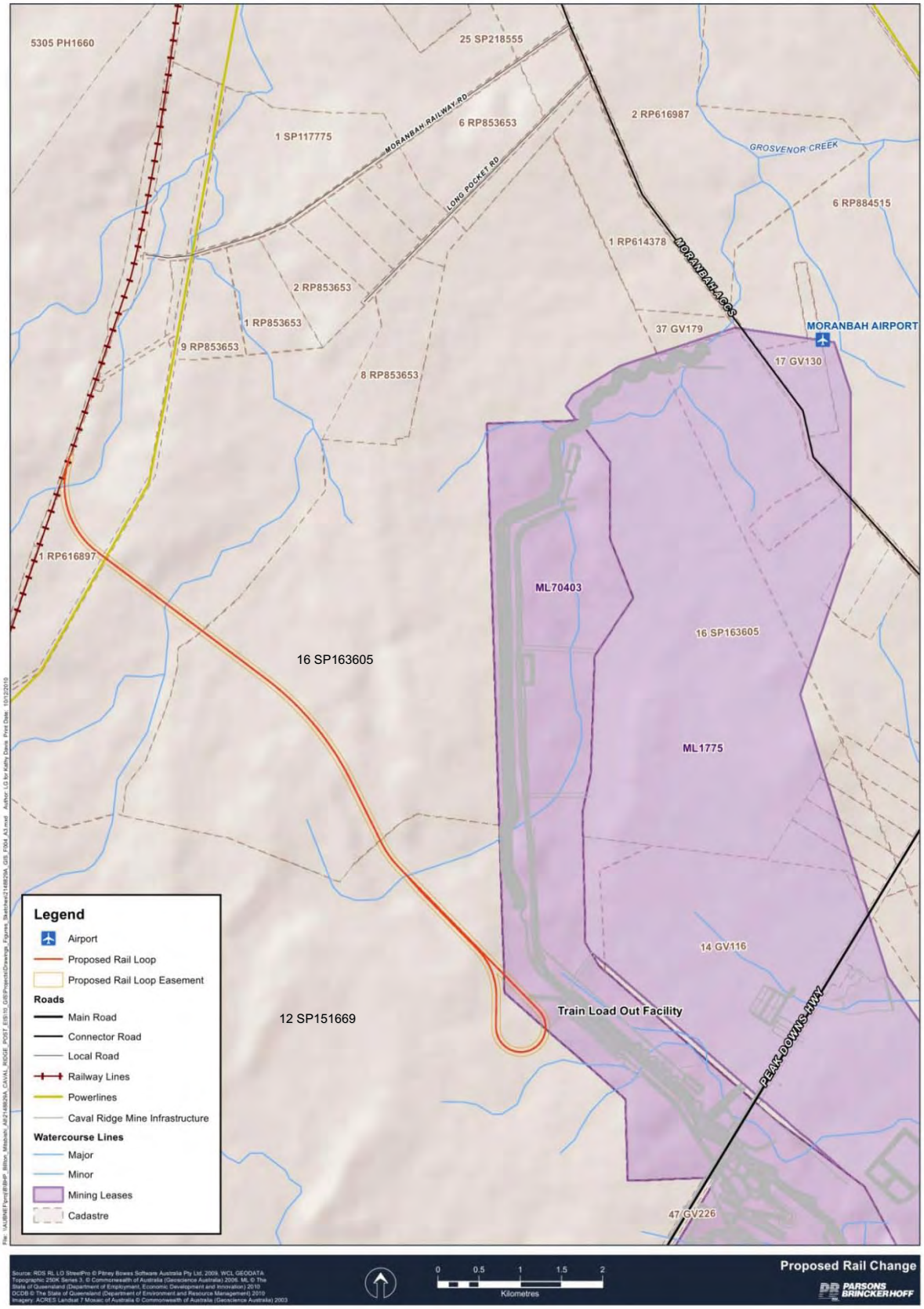


Figure 3.2 Proposed rail alignment change

Table 3-2 Comparison of rail change to EIS/SEIS

Aspect	EIS	SEIS	Effects of the Rail Proposed Change on the Project
Land resources	19 percent (11.7 ha) of the rail corridor outside ML70403 was classified as good quality agricultural land (GQAL) suitable for cultivation for crop or animal production. The majority of land disturbance is the result of excavation of the open cut pit, placement of out-of-pit overburden dumps and haul road and mine industrial area construction. The area of the rail corridor outside ML70403 was 62.38 hectares.	No change to the rail line presented in EIS. Site specific information used to develop a new GQAL map. The new analysis indicated that no GQAL was considered to exist within the rail corridor outside ML70403.	Soil types, land suitability and agricultural land classes in proposed rail corridor do not differ significantly from those in the approved rail corridor. However only the relative proportion of soil types has changed. Refer to Figure 3.3 below. 68 percent (67 hectares) of the proposed rail corridor outside ML70403 is classified as Agricultural Land Class (ALC) C1. This includes land inside the rail loop area. Refer Figure 3-4 below. It is considered that the impact to GQAL is justified in this instance, as the adjacent land area will still continue to support actively grazing pursuits (refer Section 3.4.1 of this Change Request). Slight increase to the disturbance area of the proposed rail corridor outside ML70403 – now 102.58 hectares.
Mineral waste	Not applicable		
Surface water resource	Flood assessment undertaken for Horse Creek and Caval Creek. Q50 and Q100 flood extents provided for Horse Creek, while Caval Creek flood levels contained within channel banks except at its junction with Cherwell Creek. Baseline water quality data provided for Horse Creek, however no specific monitoring for Caval Creek. Proposed diversion of Horse Creek.	No change to the rail line presented in EIS. Clarification provided on some aspects of surface water resource.	Minimal impact on Horse Creek flood extents expected, however further work in detailed design is required to quantify these impacts (if any). No change to the flood extents of Caval Creek presented in the EIS. No change to the baseline water quality requirements presented in the EIS. No change to proposed diversion of Horse Creek presented in the EIS.
Groundwater	There were no groundwater recharge issues relating to the rail line. There was no groundwater monitoring required related to the rail line. No localised impacts on regional groundwater levels expected as the 13 nearest registered bores are not in the vicinity of the rail line.	No change to the rail line presented in EIS. Clarification provided on some aspects of groundwater.	No change to the groundwater recharge and monitoring, and regional groundwater levels presented in the EIS.

Aspect	EIS	SEIS	Effects of the Rail Proposed Change on the Project
Ecology (terrestrial and aquatic)	No impact on any mapped remnant vegetation. Mapped regrowth vegetation and mapped essential habitat not assessed. No impact on any field identified flora or fauna species of conservation significance. No impact on any field verified threatened ecological communities or threatened flora or fauna species. Declared pest species (flora and fauna) were identified as occurring within the project site. Impacts to specific local drainage lines not specified.	No change to the rail line presented in EIS. Clarification provided on some aspects of terrestrial and aquatic ecology.	No impact on any mapped remnant vegetation, regrowth vegetation or mapped essential habitat. No impact expected on conservation significant flora individuals or habitat. Fauna species of conservation significance may occur in the rail corridor however the mitigation and offset measures detailed in the EIS and SEIS are still sufficient and will be implemented. No impact expected on threatened ecological communities or threatened flora species. Threatened fauna species may occur in the rail corridor however the mitigation measures detailed in the EIS and SEIS are still sufficient and will be implemented. Declared pest species (flora and fauna) expected to occur in the rail corridor however the mitigation and management measures detailed in the EIS and SEIS are still sufficient and will be implemented. Two mapped drainage lines will be traversed by rail line, both expected to be ephemeral and not supporting any significant aquatic habitat. Mitigation and management measures detailed in the EIS and SEIS are still sufficient and will be implemented.
Air quality	Overall, the matter of air quality is not relevant to the proposed change to the rail alignment, however as the rail line is shifted further south there will be a reduction in dust impacts on sensitive receptors (Moranbah township located north of the Caval Ridge Mine).		
Noise and vibration	Operational plant (e.g. processing plant, overland conveyors and mobile mechanical plant used in mining) would dominate noise levels. Average L_{Aeq} noise levels predicted to increase by up to 2-3 dBA at 12 locations under worse case weather conditions. Engineering solutions to be implemented to achieve acceptable noise levels at all locations except two dwellings (located on Lot 1 RP616897 and Lot 12 SP151669). Resumption or agreement with the landowners of these lots was considered.	No change to the rail line presented in EIS. Clarified that BMA owned 5 of 12 noise-affected properties. Mitigation at BMA-owned properties would be complaints based with monitoring if required. The primary form of mitigation for noise and vibration at these noise-affected adjoining properties will be an 'adverse noise out clause' on all lease	Nearest noise-affected receptors to the proposed rail line are located on Lot 1 RP616897 and Lot 12 SP151669. BMA has now acquired noise-affected lots (Lot 1 RP616897 and Lot 12 SP151669) and will control the occupancy of these lots to meet operational and environmental requirements. Mine operational noise remains the dominant source in all modelling scenarios. On Lot 12 SP151669, average L_{Aeq} noise levels exceed relevant noise criteria by up to 17 dBA for both the approved and proposed rail line. Therefore there is no worsening of the previous scenario. No additional mitigation measures required.

Aspect	EIS	SEIS	Effects of the Rail Proposed Change on the Project
	No mitigation measures investigated for noise affected lots owned by BMA. Vibration impacts are only related to blasting activities. Therefore vibration impacts are not relevant to the proposed rail change.	agreements.	
Waste management	Not applicable		
Transport and traffic	Not applicable		
Cultural heritage and Native Title	Indigenous cultural heritage values existing on the project site, with the greatest concentrations found in erosion and mine-related exposures along creeks. BMA entered into negotiations with the BBKY People (now the BaradaBarna People) to develop a Cultural Heritage Management Plan (CHMP). No sites of Non-Indigenous cultural heritage significance. Five places of historical interest were identified however these were not in the vicinity of the rail line.	No change to the rail line as presented in the EIS. Confirmed the Construction and Site Environmental Management Plans would set out strategies to mitigate impact to unexpected cultural heritage material or sites.	An Indigenous cultural heritage inspection of the revised rail corridor was undertaken by the BaradaBarna (BB) Claim Group. Items of cultural heritage significance found were relocated apart from trees which will be avoided by the rail line. There will be no further impacts on known sites of Non-Indigenous cultural heritage significance If unexpected cultural heritage material or sites are found during construction phase the strategies detailed in the EIS and SEIS will be followed. The CHMP was signed between the BB Claim Group and BMA in June 2010.
Social impacts	Not applicable		
Economic impacts	Economic impacts of the Project were considered based on the rail parameters listed in Table 4-1 of this Change Request (e.g. rail line length of 17.5 km).	No change to the rail line presented in EIS.	The Project will be more cost-effective as the proposed length of the rail line is reduced by 5 kilometres.
Workforce accommodation villages	Not applicable		

Aspect	EIS	SEIS	Effects of the Rail Proposed Change on the Project
Greenhouse gas emissions	Greenhouse gas (GHG) emissions for construction and operational phases were estimated. Scope 3 GHG emissions included transporting coal via rail to ports.	No change to the rail line presented in EIS.	The GHG assessment took a holistic approach to determining the project's scope 1 and scope 2 emissions during construction. It did not differentiate between specific infrastructure components such as the rail loop spur as this was not considered practicable. Furthermore the Coordinator-General's Report concluded that Scope 3 GHG emissions be excluded from any offset considerations of the Project as they occur from sources not owned/controlled by the Project.

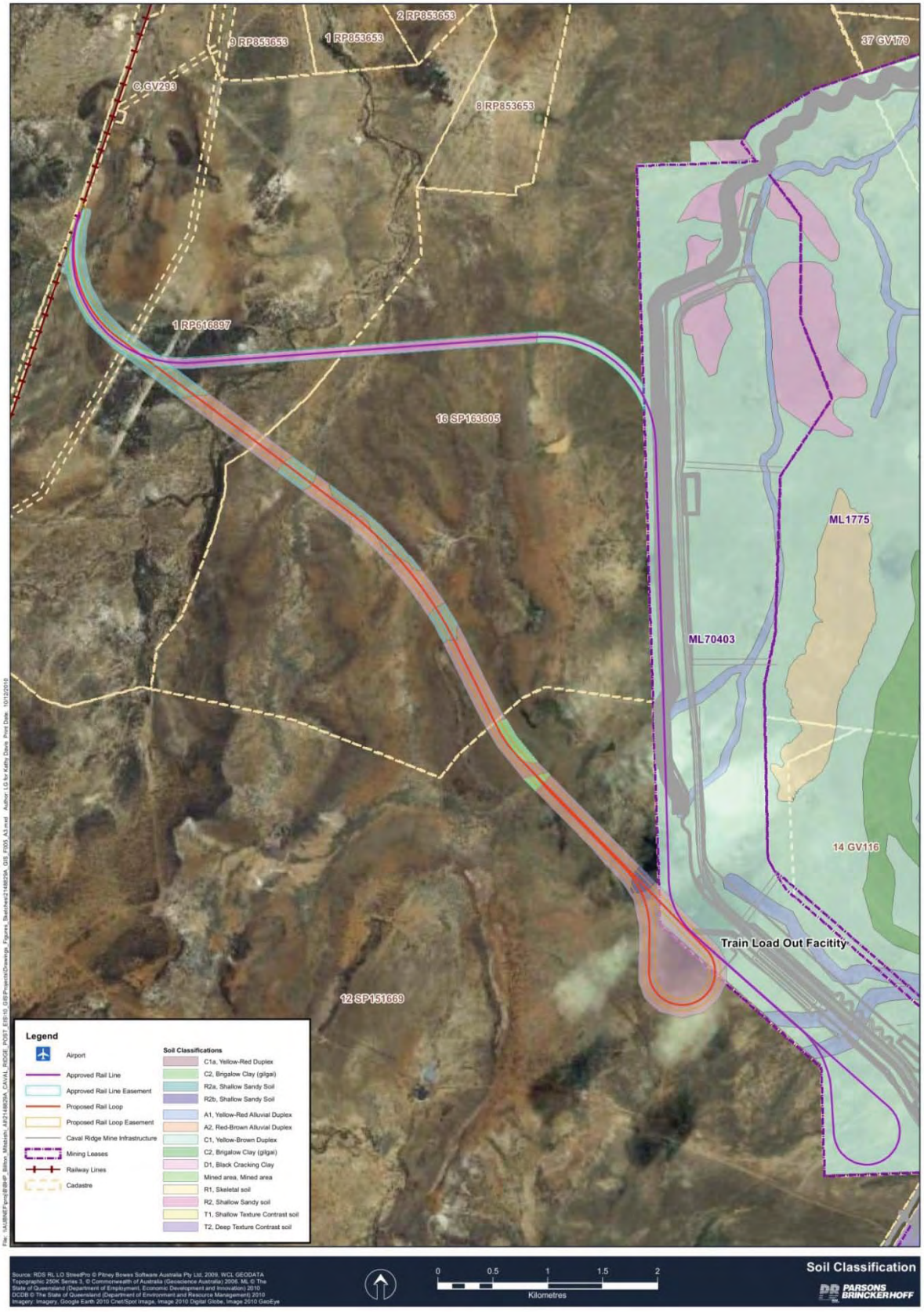


Figure 3.3 Soil classification

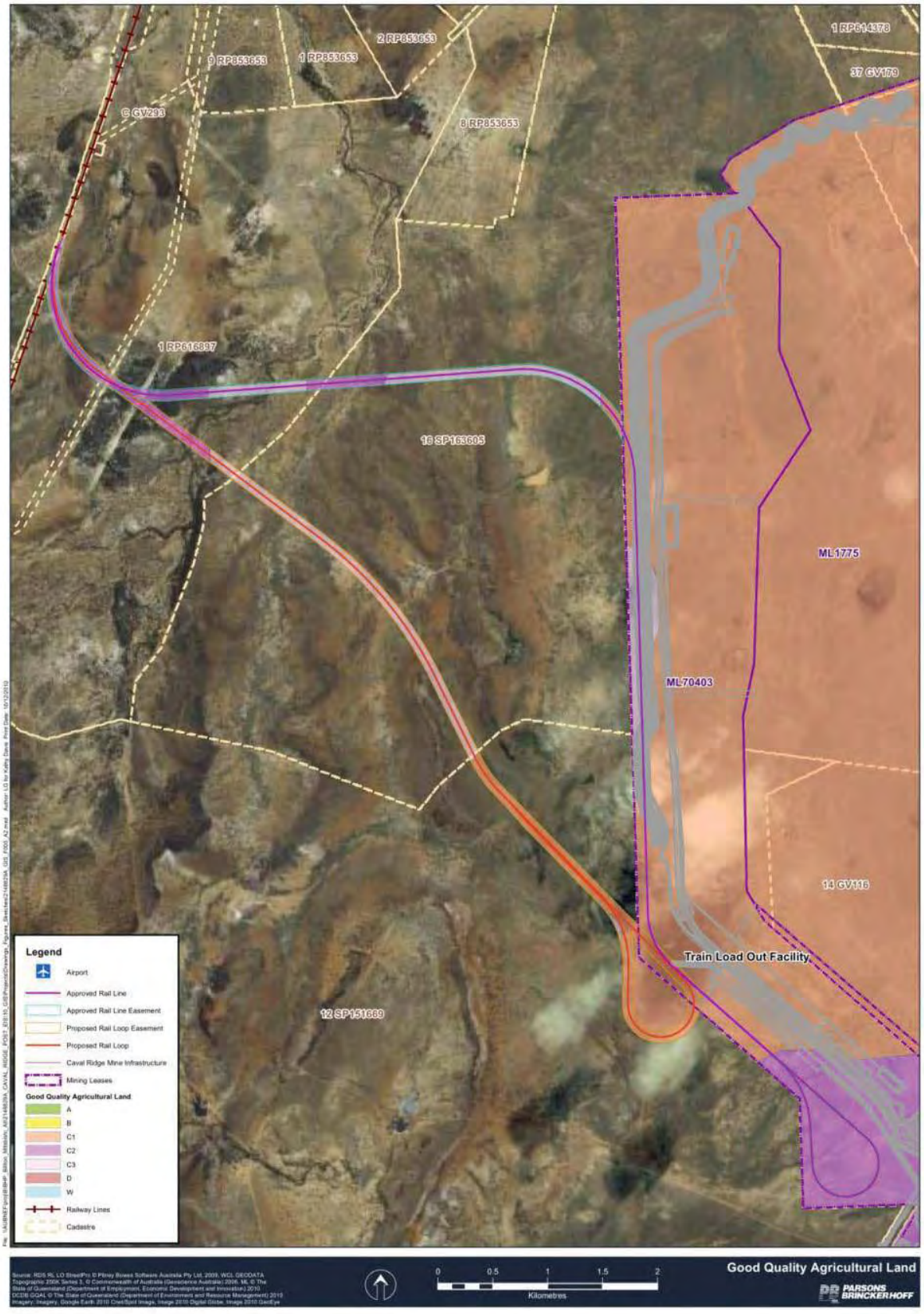


Figure 3.4 Good quality agricultural land

3.3 Reason for proposed change

This section sets out the reasons for the proposed change to rail, as required under Section 35E(b) of the SDPWOA.

Since the preparation of Caval Ridge Mine EIS and SEIS in 2009, BMA has secured ownership of Lot 1 RP616897 and Lot 12 SP151669, which lie west of ML70403. This has presented an opportunity to realign the rail line as presented in the EIS and SEIS. It is now proposed to traverse land wholly owned by BMA.

The proposed rail line provides a more direct route between the Blair Athol Line and the relocated TLO facility, being 5 kilometres shorter than the approved rail line. The proposed rail line also reduces noise impacts upon sensitive receptors as the rail line will be up to 4 kilometres further south of Moranbah (refer to Section 3.4.7 of this Change Request for further detail).

The product coal stockpiles were relocated to an area north of Caval Creek to reduce extensive civil works associated with diversion of the creek. The relocation of the product stockpiles (moved approximately 2.5 kilometres further west) has made it possible to optimise the realignment of the rail spur and loop, reducing significant earthworks and the number of under-track surface water drainage culverts.

3.4 Potential effects of the proposed change

In response to Section 35E(c) of the SDPWOA, this section outlines the potential effects of the proposed rail change on the project.

The impacts and required mitigation measures for the proposed rail change are detailed in this sub-section.

3.4.1 Land resources

From a regional perspective, the proposed rail line is subject to the same climatic forces as the approved rail line. Also there are no major changes in terms of topography, geomorphology, geology and soils. This is demonstrated in Appendix D. There are minor changes in relation to potential impacts to GQAL and land disturbance outside ML70403. The potential impacts of the proposed rail change on soil resources are outlined in Table 3-3 of this Change Request.

Table 3-3 Potential impacts of proposed rail change on soil resources

EIS	SEIS	Rail Proposed Change
GQAL		
Section 4 of the EIS assessed impacts on land resources within the ML70403, ML1775 and rail corridor including land capability, land suitability and GQAL. 19 percent (11.7 ha) of the rail corridor outside ML70403 was classified as GQAL suitable for cultivation for crop or animal production (no special practices required).	No change to the rail line as presented in the EIS. Section 5.4.2.2 of the SEIS did review land suitability and GQAL mapping. As part of the SEIS, site specific information was used to develop a new figure for GQAL (refer Figure 4.16 in SEIS) instead of regional data. The new analysis indicated that no GQAL was considered to exist within the rail corridor outside ML70403.	The soil types and associated land suitability and agricultural land classes found within the proposed rail corridor do not differ significantly from those in the approved rail corridor. However the relative proportion of soil types has changed. Refer Figure 3-3 of this Change Request. 68 percent (67 hectares) of the proposed rail corridor outside ML70403 is classified as Agricultural Land Class C1, which is GQAL suitable for grazing purposes. This includes land inside the rail loop

EIS	SEIS	Rail Proposed Change
		area. Refer Figure 3-4 of this Change Request. **Note:** The Agricultural Land Class (ALC) rating has Class C land as suited to grazing only. Class A and B lands are cropping lands, and Class D being non agricultural land. In some regions Class C (grazing land) is further distinguished into C1, C2 and C3, with C1 being the best quality grazing land. It is considered that the impact to GQAL is justified in this instance, as the adjacent land area will still continue to support active grazing pursuits. There will be energy savings, cost savings and reduced noise impacts associated with this shorter rail alignment. This in turn provides better environmental outcomes, particularly over time with reduced GHG emissions. The impact to GQAL is also considered relatively minor in comparison to the impact on GQAL from the substantial mining operation area, which adjoins to the west.
Land disturbance outside ML70403		
The majority of land disturbance was to be a result of excavation of the open cut pit, placement of out-of-pit overburden dumps and haul road and mine industrial area construction. The area of the rail corridor outside ML70403 was 62.38 hectares.	No change to the rail line as presented in the EIS.	The area of the proposed rail corridor outside the ML70403 is now 102.58 hectares. In terms of the overall land disturbance for the Project, this area is considered to be minor.

In addition, the proposed rail change does not introduce any new land uses, sensitive environmental areas, landscape character, visual amenity elements or contaminated land matters, beyond those already considered by the EIS and SEIS. Of note, Lot 12 SP151669 does not contain any sensitive environmental areas (as listed in Section 4.6 of EIS) and is not listed on the Environmental Management Register or Contaminated Land Register.

The proposed rail line will not alter any recommendations or conditions identified in the Coordinator-General's Report, specifically Recommendation 2, Schedule 5, Appendix 1 (GQAL). It is highlighted that QR has granted "approval in principle" for the proposed rail alignment (refer Appendix C).

One matter that was not considered in the EIS and SEIS because it has only recently become a matter of State interest is that of strategic cropping land. In August 2010 DERM published a policy framework for

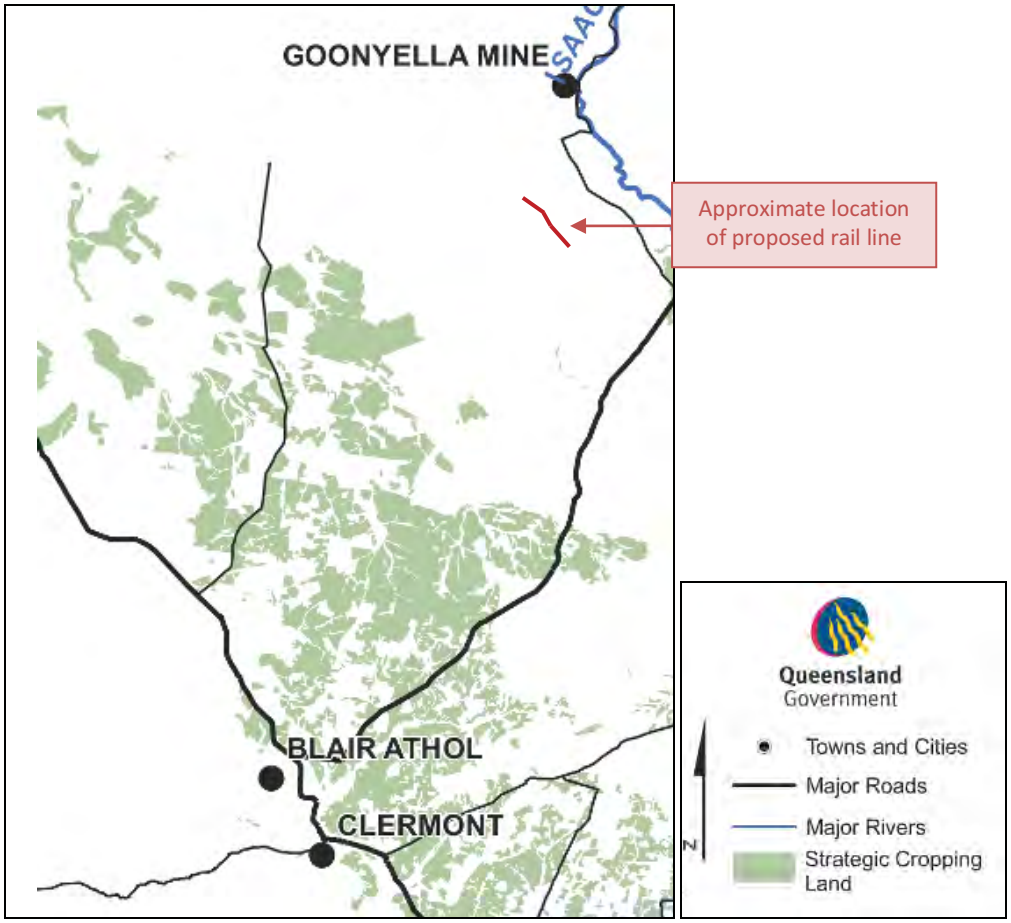
protecting Queensland's strategic cropping land. The objective of the policy is to identify and protect the best of Queensland's cropping land resources, and achieve a balance between the competing interests of agriculture, mining and urban development.

The policy framework is closely aligned with State Planning Policy 1/92 for the Conservation of Good Quality Agricultural Land (SPP 1/92), which protects a broader range of agricultural land from development.

A 2009 review of SPP 1/92 identified urban development and mining as continued threats to good-quality agricultural land. The strategic cropping land policy framework focuses on achieving long-term co-existence between cropping land and Queensland's expanding resources sector and urban development.

DERM, in conjunction with a Strategic Cropping Land Stakeholder Advisory Committee, has developed the policy framework, which was released for public consultation between August and September 2010. The policy framework will continue to be developed, whereby the Regulatory Assessment Statement and draft SPP was released for public consultation in early 2011. Until such time as the draft SPP is released, the strategic cropping land policy framework will not have any regulatory weight or effect. Although the policy framework includes draft trigger maps which identify strategic cropping land within the State, on-ground assessments are expected to verifying if a mapped area is strategic cropping land.

With regard to this Project, the 'Strategic Cropping Land – Draft Trigger Map C52' of the policy framework indicates the proposed rail alignment does not cross strategic cropping land. An extract of the draft map is provided in Figure 3.5 below. Therefore this matter is not considered relevant to this Change Request.



Source: DERM 2010

Figure 3.5 Draft strategic cropping land map (DERM 2010)

3.4.2 Mineral waste

The Project's Mineral waste includes the overburden/interburden (spoil) removed to expose the coal resources, and coarse and fine rejects from coal processing. This activity is associated with the Project's mining operation. As mineral waste is not relevant to the proposed rail change, there will be no alterations to any recommendations or conditions identified in the Coordinator-General's Report. Accordingly this matter did not require assessment as part of this Change Request.

3.4.3 Surface water resources

The proposed rail change has minimal impact in terms of surface water impacts when compared to those identified in the EIS and SEIS. The approved rail line previously crossed Horse Creek and Caval Creek inside ML70403. However, the proposed rail line will now cross only one drainage line at a point outside ML70403 (this drainage line is defined as Horse Creek further downstream).

An assessment of the surface water impacts associated with the proposed rail change is provided in Appendix E of this Change Request. Surface water impacts identified in the EIS and SEIS, as well as through this Change Request, are summarised in Table 3-4 below.

Table 3-4 Potential impacts of proposed rail change on surface water resources

EIS	SEIS	Rail Proposed Change
Flood assessment – Horse Creek		
Flood assessment for Horse Creek undertaken with upstream and downstream boundaries being the defined project site. Q50 and Q100 flood extents provided.	No change, clarification provided in SEIS.	Flood assessment does not include new rail alignment as this is outside the original defined site boundary. Minimal impact to be expected. BMA will undertake further work in detailed design to quantify these impacts, if any.
Flood assessment – Caval Creek		
Caval Creek flood levels are contained within the channel banks, except at the junction of Caval and Cherwell Creek.	No change, clarification provided in SEIS.	No change due to new rail alignment.
Water quality		
Baseline water quality data provided for Horse Creek and tributaries (four water quality sites in total). No specific water quality monitoring for Caval Creek.	No change, clarification provided in SEIS.	No change due to new rail alignment.
Creek diversions		
Diverts Horse Creek flows adjacent to the haul road that runs along the length of the proposed open cut pit and along the mining lease boundary.	No change, clarification provided in SEIS.	No change due to new rail alignment.

The proposed rail line will not alter any recommendations or conditions identified in the Coordinator-General's Report. The changes will alter the physical alignment of the rail component however will not alter the material use of the proposal.

3.4.4 Groundwater resources

The proposed rail change has minimal impact in terms of the previous groundwater impacts. Rail infrastructure will be located at ground level with minor cut and fill areas, which will not influence natural groundwater recharge or regional flow patterns. No additional groundwater monitoring is required to either establish a baseline or within the ongoing groundwater monitoring program.

An assessment of the groundwater impacts associated with the proposed rail change is provided in Appendix E. Groundwater impacts identified in the EIS and SEIS, as well as through this Change Request, are summarised in Table 3-5 below.

Table 3-5 Potential impacts of proposed rail change on groundwater resources

EIS	SEIS	Rail Proposed Change
Groundwater recharge		
No issues relating to the rail line.	No change.	No change, although rail alignment and loop has moved.
Groundwater monitoring		
No specific rail line monitoring required.	No change.	No change, although rail alignment and loop has moved.
Regional groundwater level		
13 registered bores within 10 kilometres of site boundary – none of which are located near the rail line – therefore assume no or localised impact	No change.	No change.

The proposed rail line will not alter any recommendations or conditions identified in the Coordinator-General's Report.

3.4.5 Ecology (terrestrial and aquatic)

As a result of the proposed rail change, the overall length of the rail line is reduced by approximately 5 kilometres and the area of disturbance associated with the rail loop is also reduced by 50 hectares.

The proposed rail alignment does not traverse any mapped remnant or high-value regrowth vegetation areas. A search of the EPBC Act Protected Matters database indicates that threatened ecological communities may occur within the broader rail alignment area. However, air photo interpretation information indicates that these vegetation communities are not likely to be present within the proposed rail alignment, and therefore no impact to these communities is expected to occur. However, mitigation and compensatory measures outlined in the EIS and SEIS will still be implemented to ensure any potential impacts are identified and managed appropriately.

Flora and fauna species of conservation significance (at both the Commonwealth and State levels) potentially use habitat and occur within the proposed rail alignment area. Impact mechanisms (namely clearing, construction activities, and project operation) as identified in the EIS, will also apply to the proposed rail alignment. However, mitigation and compensatory measures outlined in the EIS and SEIS will still be implemented to ensure any potential impacts are identified and managed appropriately.

Two mapped drainage lines will be traversed by the proposed rail alignment. These drainage lines are expected to be ephemeral in nature, and not expected to support any significant aquatic habitat. Mitigation and management measures listed in the EIS and SEIS are applicable to design, construction and operation of the proposed rail infrastructure.

An assessment of the ecology impacts associated with the proposed rail change is provided in Appendix F. Ecology impacts identified in the EIS and SEIS, as well as through this Change Request, are summarised in Table 3-6 of this Change Request.

Table 3-6 Potential impacts of proposed rail change on ecology (terrestrial and aquatic)

Ecological consideration	EIS	SEIS	Rail Proposed Change
Terrestrial ecology			
Mapped remnant vegetation	Rail alignment does not impact on any mapped remnant vegetation.	No change.	Rail alignment does not impact on any areas of mapped remnant vegetation.
Mapped regrowth vegetation	Not assessed in EIS.	Not applicable.	Rail alignment does not impact on any areas of mapped regrowth vegetation.
Flora species of conservation significance (NC Act)	Rail alignment does not impact on any field identified flora species of conservation significance.	No change.	Based on review of State mapping the Rail line will not impact on conservation significant flora individuals or habitat.
Fauna species of conservation significance (NC Act)	No fauna species of conservation significance identified in rail alignment.	No change.	Fauna species of conservation significance may occur in the rail alignment area as a result of the database search and aerial photograph interpretation. Results from this analysis indicate that the ecological values presented by the vegetation and habitat potentially impacted by the revised rail corridor does not appear to differ from the original rail spur alignment presented in the EIS and SEIS. Primarily, this vegetation is non-remnant grassland and low/open non-remnant woodland that is not classified as remnant and is not of legislative conservation significance. Further significant field studies to assess floristic assemblage, fauna habitat values, fauna movement opportunities and ecological integrity were not deemed necessary due to the relatively low ecological values present. Mitigation and compensatory measures as outlined in the EIS and SEIS are deemed to be applicable and sufficient to manage potential impacts associated with the development and operation of the rail infrastructure. No new measures are proposed.
Threatened ecological communities (EPBC Act)	Rail alignment does not impact on any field verified threatened ecological communities (EPBC Act).	No change.	Air photo interpretation indicates that EPBC Act threatened ecological communities are not likely to occur within the rail alignment area.
Threatened flora species (EPBC Act)	Rail alignment does not impact on any field identified threatened flora species (EPBC Act).	No change.	Rail alignment is not expected to impact on *Cycas ophiolitica* individuals or habitat.
Threatened fauna species (EPBC Act)	No threatened fauna species identified in rail alignment.	No change.	Threatened fauna species may occur in the rail alignment area, however due to the relatively low ecological values present it is unlikely that they may occur. Mitigation and compensatory measures as outlined in the EIS and SEIS are deemed to be applicable and sufficient to manage potential impacts associated with the development and operation of the rail infrastructure. Therefore no new

Ecological consideration	EIS	SEIS	Rail Proposed Change
			measures are proposed.
Mapped Essential Habitat	Not assessed in EIS.	Not applicable.	Rail alignment does not impact on any areas of mapped Essential Habitat.
Declared pest plant species (LP Act)	Declared pest plant species were identified as occurring within Caval Ridge Mine site.	No change.	Declared pest plant species are expected to inhabit the rail alignment area. Management and mitigation strategies for this issue as detailed in the EIS and SEIS are deemed to be relevant for the subject rail alignment area.
Declared pest fauna species	Declared pest fauna species were identified as occurring within Caval Ridge Mine site.	No change.	Declared pest fauna species are expected to inhabit the Change Request rail alignment area. Management and mitigation strategies for this issue as detailed in the EIS and SEIS are deemed to be relevant for the subject rail alignment area.
Aquatic ecology			
Impact to aquatic habitat (e.g. drainage lines)	Potential impact of the rail alignment on specific local drainage lines was not specified in the EIS.	Construction of creek or gully crossings were mentioned in the SEIS (refer Section 5.9.2.3) and impact mitigation and management strategies outlined (Section 5.9.2.2)	Two mapped drainage lines will be traversed by the rail alignment. These drainage lines are expected to (1) be ephemeral in nature and (2) not to support any significant aquatic habitat. Mitigation and management measures as outlined in the EIS and SEIS are deemed to be applicable and sufficient to manage potential impacts associated with the development and operation of the rail infrastructure. Therefore no new measures are proposed
Aquatic fauna species of conservation significance (NC Act)	No aquatic fauna species of conservation significance identified in rail alignment.	No change.	No aquatic fauna species of significance were identified through database searches. Significant impacts to aquatic fauna are not expected as a result of the rail alignment. Mitigation and compensatory measures as outlined in the EIS and SEIS are deemed to be applicable and sufficient to manage potential impacts associated with the development and operation of the rail infrastructure. Therefore no new measures are proposed.
Threatened aquatic fauna species (EPBC Act)	No threatened aquatic fauna species identified in rail alignment.	No change.	No threatened aquatic fauna species were identified through database searches. Significant impacts to aquatic fauna are not expected as a result of the rail alignment. Mitigation and compensatory measures as outlined in the EIS and SEIS are deemed to be applicable and sufficient to manage potential

Ecological consideration	EIS	SEIS	Rail Proposed Change
			impacts associated with the development and operation of the rail infrastructure. Therefore no new measures are proposed.
Aquatic flora species of conservation significance (NC Act)	Rail alignment does not impact on any field identified flora species of conservation significance.	No change.	No aquatic flora species of significance were identified through database searches. Significant impacts to aquatic flora are not expected as a result of the rail alignment. Mitigation and compensatory measures as outlined in the EIS and SEIS are deemed to be applicable and sufficient to manage potential impacts associated with the development and operation of the rail infrastructure. Therefore no new measures are proposed.
Threatened flora species (EPBC Act)	Rail alignment does not impact on any field identified threatened flora species (EPBC Act).	No change.	No threatened aquatic flora species were identified through database searches. Significant impacts to aquatic flora are not expected as a result of the rail alignment Mitigation and compensatory measures as outlined in the EIS and SEIS are deemed to be applicable and sufficient to manage potential impacts associated with the development and operation of the rail infrastructure. Therefore no new measures are proposed.

The proposed rail line will not alter any recommendations or conditions identified in the Coordinator-General's Report. Furthermore, no change to the EPBC Act approval is anticipated.

3.4.6 Air quality

The EIS and SEIS considered the potential release of dust from the site due to earth moving and mining activities associated with the construction and operation of the Project. The only mining process that is relevant to the rail change, and that will generate dust, is the dumping of product coal into the rail wagons at the TLO facility. As mentioned earlier in this Change Request, the TLO facility will be moved slightly north-west of its approved location. In terms of potential dust impacts on surrounding communities, it is considered the relocated TLO facility will have negligible impact on the extent of dust generated by this activity.

However, as the rail line is shifted further south there will be a reduction in dust impacts on sensitive receptors (Moranbah township located north of the Caval Ridge Mine).

The proposed rail line will not alter any recommendations or conditions identified in the Coordinator-General's Report, specifically Condition 9(c), Schedule 1, Appendix 1 (community complaints register); Conditions 16(a)-(f), Schedule 1, Appendix 1 (air quality review); Recommendations 6(a)-(b), Schedule 5, Appendix 1 (communicating with the community).

3.4.7 Noise and vibration

During the construction and operational phases of the Project, noise and vibration impacts will be generated. An assessment of the noise impacts associated with the proposed rail change is provided in Appendix G. Vibration impacts are related to blasting activities and therefore not relevant to the proposed rail change.

Noise impacts identified in the EIS and SEIS, as well as through this Change Request, are summarised in Table 3-7. A clear benefit of the realigned rail line is that this noise corridor will be further distanced (up to 4 kilometres) from the Moranbah Township. BMA has also acquired two noise-affected lots to control occupancy of these lots and meet operational and environmental requirements.

Table 3-7 Potential impacts of proposed rail change on noise

EIS	SEIS	Rail Proposed Change
Section 12 and Appendix M of the EIS assessed noise and vibration impacts from the Project, including the rail line. The EIS predicted that operational plant (e.g. processing plant, overland conveyors and mobile mechanical plant used in mining) would dominate noise levels. Average LAeq noise levels were predicted to increase by up to 2-3 dBA at 12 locations under worse case weather conditions. Engineering solutions can be implemented to achieve acceptable noise levels at all locations except two dwellings (located on Lot 1 RP616897 and Lot 12 SP151669). Resumption or agreement with the landowners of these lots was to be considered.	No change to the rail line as presented in the EIS. Section 5.12 of the SEIS addressed noise-related concerns raised by 20 percent of all respondents. It was clarified that BMA owned 5 of the 12 noise-affected properties. Mitigation at the BMA-owned properties would be complaints based (in combination with validation monitoring if required). The primary form of mitigation for these properties will be an adverse noise out clause in all leases. Appendix K of the SEIS addressed concerns regarding low frequency noise from the Project. This is not considered relevant to the proposed rail change.	The nearest noise-affected receptors to the proposed rail line are located on Lot 1 RP616897 and Lot 12 SP151669. Since the SEIS, BMA has acquired Lot 1 RP616897 and Lot 12 SP151669 and will manage the occupancy of these lots to meet operational and environmental requirements. No increase in maximum predicted exceedance of $L_{Aeq(1\text{-}hour)}$ and L_{Amax} noise criteria (e.g. mine operational noise remains the dominant source in all modelling scenarios). Increase of up to 1 dBA in L_{Aeq} and up to 6 dBA in L_{Amax} noise levels at 7 locations for some modelling scenarios. On Lot 12 SP151669, average

EIS	SEIS	Rail Proposed Change
No mitigation measures were investigated for noise affected lots owned by BMA.		L_{Aeq} noise levels exceed relevant noise criteria by up to 17 dBA for both the approved and proposed rail line. Therefore there is no worsening of the previous scenario. However, L_{Amax} increased by up to 6 dBA in all modelling scenarios (previously compliant). No additional mitigation measures are required.

The proposed rail line will not alter any recommendations or conditions identified in the Coordinator-General's Report, specifically Condition 9(c), Schedule 1, Appendix 1 (community complaints register and response system); and Conditions 5–8, Schedule 1, Appendix 1 (BMA's communication obligations).

3.4.8 Waste management

Waste management for the Project is required for solid, liquid and gaseous waste streams. This activity is associated with the Project's mining operation. As waste management is not relevant to the proposed rail change, there will be no alterations to any recommendations or conditions identified in the Coordinator-General's Report. Accordingly this matter did not require assessment as part of this Change Request.

3.4.9 Transport and traffic

The EIS and SEIS considered the potential transport and traffic impacts associated with the Project. This section of the EIS and SEIS focused on traffic impacts and was not specifically related to the rail line because the impacts of the rail line between the Blair Athol Line and TLO facility were adequately covered in other sections of the EIS and SEIS.

It is noted that the proposed rail line will not cross any roads or stock routes. There are no rail-related recommendations or conditions identified in the Coordinator-General's Report that relate to this matter. Accordingly this matter did not require assessment as part of this Change Request.

3.4.10 Cultural heritage and native title

The EIS and SEIS considered the potential Indigenous and Non-Indigenous cultural heritage impacts associated with the Project. Assessments of the cultural heritage impacts associated with the proposed rail change are provided in Appendix H (Indigenous Cultural Heritage) and Appendix I (Non-Indigenous Cultural Heritage). Cultural heritage impacts identified in the EIS and SEIS, as well as through this Change Request, are summarised in Table 3-8 below. Overall, there are no cultural heritage values that impede the development of the proposed rail line.

Table 3-8 Potential impacts of proposed rail change on cultural heritage and Native Title

EIS	SEIS	Rail Proposed Change
Indigenous cultural heritage and Native Title		
Section 15.2 and Appendix O1 of the EIS assessed Indigenous cultural heritage impacts from the Project, including the rail line. The Indigenous cultural heritage survey identified numerous cultural heritage sites, items and significant natural features of Indigenous origin (e.g. stone artefacts, scarred trees and fireplaces). Greatest concentrations of artefacts found in erosion and mine-related exposures along high banks and terraces of Cherwell Creek, Harrow Creek and Horse Creek. Identified the need for a CHMP. ML1775 is currently the subject of a CHMP between BMA and the BBKY People (now BaradaBarna People). Negotiations were underway to use that CHMP as a basis for a new CHMP specific to Caval Ridge Mine.	No change to the rail line as presented in the EIS. Confirmed the Construction and Site Environmental Management Plans would set out strategies to mitigate impact to unexpected cultural heritage material or sites. Confirmed that BMA has in place a comprehensive Cultural Heritage Management Program. The BMA 'Permit to Disturb' system is used to ensure areas are surveyed for Indigenous cultural heritage artefacts and mitigation measures implemented prior to disturbance of those areas.	Woora Consulting has documented the results of a cultural heritage inspection undertaken by the BaradaBarna (BB) Claim Group of the proposed rail corridor (refer to Appendix H). Items of cultural heritage significance were identified however these were relocated apart from trees which will be avoided. It was confirmed that the proposed rail line does not conflict with the grove of old Brigalow and Native Orange vegetation. This is based on the GPS coordinates for the vegetation supplied by Woora Consulting. Some artefacts may not have been identified due to low ground visibility. Where any cultural heritage material is found during disturbance, Woora Consulting's cultural coordinator will be contacted immediately. This procedure will be documented in the construction environmental management plan. The CHMP was signed between the BB Claim Group and BMA in June 2010.
Non-Indigenous cultural heritage		
Section 15.3 and Appendix O2 of the EIS assessed Non-Indigenous cultural heritage impacts from the Project, including the rail line. No sites were identified on the National and Commonwealth Heritage Register, Register of the National Estate, and the Queensland Heritage Register. Isaac Regional Council was in the process of developing a heritage register and no specific information was available for the project site. The field survey did not identify any sites of cultural heritage	No change to the rail line as presented in the EIS. Confirmed the Construction and Site Environmental Management Plans set out strategies to mitigate impact to unexpected cultural heritage material or sites.	The firm Converge Heritage and Community has undertaken an assessment of the Non-Indigenous cultural heritage impacts of the proposed rail corridor (refer to Appendix I). The assessment concludes that there will be no further impacts on known sites of Non-Indigenous cultural heritage significance. Lot 12 SP151669 is not listed on the National and Commonwealth Heritage Register, Register of the National Estate, and the

EIS	SEIS	Rail Proposed Change
significance. Five places of historical interest were identified however these were not in the vicinity of the rail line.		Queensland Heritage Register. The heritage register is still yet to be finalised by Isaac Regional Council. Where any unexpected cultural heritage material or sites are found during the construction phase then the strategies detailed in the EIS and SEIS can be followed.

The proposed rail line will not alter any recommendations or conditions identified in the Coordinator-General's Report, specifically Recommendation 1, Schedule 4, Appendix A (preparation of a CHMP to address Aboriginal cultural heritage). The CHMP was signed by the BB Claim Group and BMA in June 2010, and is now registered with DERM's Cultural Heritage Unit.

3.4.11 Social impacts

The EIS and SEIS considered the potential social impacts associated with the Project. The issues considered (e.g. managing social impacts in resource communities, housing, workforce and employment, community health, safety and wellbeing, social infrastructure, and stakeholder engagement) are not relevant to the rail line. As social impacts are not relevant to the proposed rail change, there will be no alterations to any recommendations or conditions identified in the Coordinator-General's Report. Accordingly this matter did not require assessment as part of this Change Request.

3.4.12 Economic impacts

The EIS and SEIS considered the potential economic impacts associated with the Project. The majority of the economic issues considered (e.g. employment, property values, and local suppliers of goods and services) are not relevant to the rail line. It is, however, noted that the economic impacts of the Project were considered based on the rail parameters listed in Table 3-1 of this Change Request (e.g. rail line length of 17.5 kilometres).

A detailed cost benefit analysis and detailed comparative design engineering process has been undertaken to determine the most cost effective and functional rail alignment. This process took a number of factors into consideration including construction material quantities and operating costs. It was concluded that the Project will be more cost-effective as the proposed length of the rail line will be reduced by 5 kilometres.

There will be no alterations to any recommendations or conditions identified in the Coordinator-General's Report.

3.4.13 Workforce accommodation village

The EIS, SEIS, and Change Request Report's one and four, considered accommodation matters and strategies to deal with the construction and operational workforce required for the Project. These matters are not relevant to the proposed rail change. Thus, there will be no alterations to any recommendations or conditions identified in the Coordinator-General's Report, and this matter did not require assessment as part of this Change Request.

3.4.14 Greenhouse gas emissions

The EIS, SEIS and explanatory material dated May 2010 considered estimation of GHG emissions associated with the construction and operational phases of the Project. Greenhouse gas emissions associated with rail infrastructure were accounted for in Scope 3 GHG emissions, which included transporting coal via rail to ports.

The Coordinator-General's Report concluded that during both the construction and operational phases of the Project, Scope 1 and Scope 2 GHG emissions would be significant, but a condition that imposed a definitive offset would be unreasonable and unprecedented. However the Coordinator-General imposed Condition 12, Schedule 1, Appendix 1 requiring a GHG Management Plan be implemented to address Scope 1 and Scope 2 GHG emissions.

The Coordinator-General's Report concluded that Scope 3 GHG emissions should be excluded from any offset considerations of the Project. This is because these emissions represent all other indirect GHG emissions resulting from Project activities (not already accounted for in Scope 1 and 2 GHG emissions) but occur from sources not owned or controlled by the Project.

Section 5.13 of the Coordinator-Generals Report identifies the Scope 1 and 2 emissions for the construction phase of the Caval Ridge Project. Table 3-9 is included below for ease of reference:

Table 3-9 - Table 9 CRM construction phase Scope 1 and 2 GHG emissions and indicative offset calculations

Table 9: CRM construction phase Scope 1 and 2 GHG emissions and indicative offset calculations

Construction year	Estimated emissions (Tonnes CO_2-e)	Assumed offset price ($/tonne CO_2-e)	Indicative offset calculation ($)
Year 1	35,000	20	700,000
Year 2	145,800	20	2,916,000

(Source: Coordinator-Generals Evaluation Report; Caval Ridge Mine, August 2010, pg 129)

The Scope 1 emission sources from include:

- Fuel use by construction vehicles moving in or between worksites;
- Blasting using ammonium nitrate/ fuel oil explosive; and
- On-site power generators.

Scope 2 emissions are emissions from the generation of purchased electricity.

The GHG assessment took a holistic approach to determining the project's scope 1 and scope 2 emissions during construction. It did not differentiate between specific infrastructure components such as the rail loop spur as this was not considered practicable.

There are no greenhouse gas offset requirements for the project, in particular rail-related recommendations or conditions identified in the Coordinator-General's Report that relate to this matter. BMA continues its commitment to implement a greenhouse gas management plan in accordance with Condition 12, Schedule 1, Appendix 1 of the CG's Report (August 2010).

3.5 Summary of effects/required approvals

The rail component is primarily 'off lease' and therefore will be subject to approvals under the SPA and other legislation delivered through the IDAS process (refer Schedule 3 of the SP Regulations).

Notwithstanding, the Coordinator-General's Report contains several key conditions and recommendations that relate to the environmental impacts associated with the rail line. Commentary on the imposed Conditions is contained in Appendix B of this Change Request. It is important to note that the proposed rail alignment does not materially change the project, therefore, is recommended that the Coordinator-General's Conditions do not require amendment.

4 Conclusion

Following ongoing review and value engineering studies, BMA seeks to realign the rail line between the existing Blair Athol Line and the Caval Ridge Mine TLO facility. Product coal will still be railed either to the Port of Hay Point (Hay Point Coal Terminal via the existing Blair Athol Line), or to the Abbot Point Coal Terminal (via the Newlands and North Goonyella system upon completion of the Northern Missing Link Rail). Studies since the EIS was completed have found that a realignment of the rail line will provide a more direct route between the Blair Athol Line and the relocated TLO facility, being 5 kilometres shorter than the previously approved rail line. BMA has assessed the potential impacts of the proposed rail line realignment and has concluded that it will not materially change the assessment undertaken within the Caval Ridge Mine EIS/SEIS. However, the realignment will reduce noise and ground clearance impacts upon sensitive receptors as the rail line will be approximately 4 kilometres further south of Moranbah.

The proposed changes to rail infrastructure allow for a more logical and direct alignment of the rail corridor. The proposed rail alignment does not materially change the project, therefore, it is requested that the Coordinator-General consider the requested changes and the reasons for those changes as outlined within this Report.

Appendix A – Relevant Conditions Imposed by the Coordinator-General

Appendix A – Coordinator-General's imposed conditions and recommendations relevant to Change Request 5

A1 Coordinator-General's key conditions and recommendations relevant to the rail line

Environmental aspect	Coordinator-General's Report reference	Requirement
Surface water resource	Section 5.3 **Recommendation 6(c),** Schedule 4, Appendix 1	In relation to watercourse diversions for Horse Creek, it was recommended that the following condition be attached to any licence, permit or approval required under the *Water Act 2000* for the Project – **Recommendation 6(c)** Prior to the issuing of the environmental authority under the *Environmental Protection Act 1994* for the CRM, the proponent must submit to the Department of Environment and Resource Management (DERM) an independent written analysis by an appropriately qualified professional that the final designs of all CRM creek diversions will not cause significant downstream environmental harm as a result of altered flow and flood patterns of those creeks.
Ecology (terrestrial and aquatic)	Section 5.5 **Condition 3(a)(i),** Schedule 1, Appendix 1 **Conditions 3(b)-(d),** Schedule 1, Appendix 1 **Recommendation 5,** Schedule 5, Appendix 1	**Condition 3(a)(i)** The proponent must provide an 'Offset Strategy' for approval by DERM and the Coordinator-General and the Commonwealth Department of Environment, Water Heritage and the Arts (DEWHA) before the commencement of mining operations. The Strategy must provide for and include, but not necessarily be limited to the following – the minimum area of each Regional Ecosystem (RE) to be secured by the proponent in offset arrangements for the CRM as shown in Table 3.1 (refer to Coordinator-General Report), but DEWHA may specify larger areas of each of these Endangered Ecological Communities (EECs) offsets and DERM may specify larger areas of each 'endangered' or 'of concern' RE offsets where their respective statutory authorities allow this. **Condition 3(b)** The proponent must prepare to the satisfaction of DERM and DEWHA a 'Threatened Flora and Fauna Species and Ecological Communities Management Plan' that: ensures the impacts to these species and communities are minimised contributes to the survival of these species in the wild, and achieves conservation benefits for these species and communities where practicable. **Condition 3(c)** As a minimum, the plan in (b) should include: affected species listed as endangered, vulnerable or rare under the *Nature Conservation Act 1994* affected species listed by DERM on its 'Back on Track' systems that are identified as in decline and have a good potential for recovery management measures addressing the threatened species listed in the 'controlling provisions' for the CRM under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) the proponent's commitments to implement management measures to further mitigate the impacts of mining activities on ecological values the additional and ongoing management activities to mitigate impacts to native vegetation communities outlined in

Environmental aspect	Coordinator-General's Report reference	Requirement
		chapter 8 of the CRM EIS and section 5.4 of the 'EPBC Matters Report' in Appendix C2 of the CRM EIS how the proponent will satisfy the requirements of section 322 of the Nature Conservation (Wildlife Management) Regulation 2006 relating to tampering with animal breeding places a commitment to provide information on flora and fauna management actions for significant species for inclusion in DERMs 'Recovery Actions Database' when that framework is finalised and becomes operational. **Condition 3(d)** The plan in (b) should be provided to DERM and DEWHA for review at least 28 days prior to commencement of any mining construction activity, for the CRM project other than early road works. **Recommendation 5 - Consideration of the BMA Biodiversity Offset Strategy in Appendix 2 of this report.** Recommendation that in their consideration of the BMA Biodiversity Offset Strategy for the CRM in Appendix 2 of this report, DERM and DEWHA consider: that the Coordinator-General regards the general scope of the offset proposal for brigalow at Norwich Park to be acceptable that subject to verification of sufficient integrity of the proposed offset vegetation, the Coordinator-General considers that an offset of poplar box vegetation at Blackwater of at least 450 hectares would be acceptable that subject to the provision of more detailed information, the Coordinator-General considers that the offset proposal for natural grasslands at Gregory Crinum appears to be insufficient for EPBC-listed EECs without further augmentation to avoid the risk of double-counting, the proponent delineates and quantifies in the Biodiversity Offset Strategy the areas of vegetation in each proposed offset area attributable to each phase of the Bowen Basin Coal Growth (BBCG) project the Coordinator-General's observations in section 7.3.6.3 of this report in relation to BMA's offset proposals.
Interference with a railway	Appendix , Schedule 4, Condition 3 (a) and (b)	**Interference with a railway** (a) Approval must be obtained from railway manager prior to any interference with a railway under the *Transport Infrastructure Act 1994*. (b) If any project works are likely to interfere with the operation of railway services, consultation must be undertaken with the railway manager to identify and implement actions which will minimise disruption to railway operations.

Appendix B – Commentary on Imposed Conditions

Commentary on Imposed Conditions

This Table has been prepared on the basis that this change request is considered favourably by the Coordinator-General.

Rail Imposed Conditions

Environmental aspect	Coordinator-General's Report reference	Requirement	Comment and suggested condition wording
Surface water resource	Section 5.3 **Recommendation 6(c),** Schedule 4, Appendix 1	In relation to watercourse diversions for Horse Creek, it was recommended that the following condition be attached to any licence, permit or approval required under the *Water Act 2000* for the Project – **Recommendation 6(c)** Prior to the issuing of the environmental authority under the *Environmental Protection Act 1994* for the CRM, the proponent must submit to the Department of Environment and Resource Management (DERM) an independent written analysis by an appropriately qualified professional that the final designs of all CRM creek diversions will not cause significant downstream environmental harm as a result of altered flow and flood patterns of those creeks.	**No change of condition wording required**
Ecology (terrestrial and aquatic)	Section 5.5 **Condition 3(a)(i),** Schedule 1, Appendix 1 **Conditions 3(b)-(d),** Schedule 1, Appendix 1 **Recommendation 5,** Schedule 5, Appendix 1	**Condition 3(a)(i)** The proponent must provide an 'Offset Strategy' for approval by DERM and the Coordinator-General and the Commonwealth Department of Environment, Water Heritage and the Arts (DEWHA) before the commencement of mining operations. The Strategy must provide for and include, but not necessarily be limited to the following – the minimum area of each Regional Ecosystem (RE) to be secured by the proponent in offset arrangements for the CRM as shown in Table 3.1 (refer to Coordinator-General Report), but DEWHA may specify larger areas of each of these Endangered Ecological Communities (EECs) offsets and DERM may specify larger areas of each 'endangered' or 'of concern' RE offsets where their respective statutory authorities allow this. **Condition 3(b)** The proponent must prepare to the satisfaction of DERM and DEWHA a 'Threatened Flora and Fauna Species and Ecological Communities Management Plan' that: ▪ ensures the impacts to these species and communities are minimised ▪ contributes to the survival of these species in the wild, and ▪ achieves conservation benefits for these species and communities where practicable. **Condition 3(c)** As a minimum, the plan in (b) should include: ▪ affected species listed as endangered, vulnerable or rare under the *Nature Conservation Act 1994*	**No change of condition wording required**

Environmental aspect	Coordinator-General's Report reference	Requirement	Comment and suggested condition wording
		▪ affected species listed by DERM on its 'Back on Track' systems that are identified as in decline and have a good potential for recovery ▪ management measures addressing the threatened species listed in the 'controlling provisions' for the CRM under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) ▪ the proponent's commitments to implement management measures to further mitigate the impacts of mining activities on ecological values ▪ the additional and ongoing management activities to mitigate impacts to native vegetation communities outlined in chapter 8 of the CRM EIS and section 5.4 of the 'EPBC Matters Report' in Appendix C2 of the CRM EIS ▪ how the proponent will satisfy the requirements of section 322 of the Nature Conservation (Wildlife Management) Regulation 2006 relating to tampering with animal breeding places ▪ a commitment to provide information on flora and fauna management actions for significant species for inclusion in DERMs 'Recovery Actions Database' when that framework is finalised and becomes operational. **Condition 3(d)** The plan in (b) should be provided to DERM and DEWHA for review at least 28 days prior to commencement of any mining construction activity, for the CRM project other than early road works. **Recommendation 5 - Consideration of the BMA Biodiversity Offset Strategy in Appendix 2 of this report.** Recommendation that in their consideration of the BMA Biodiversity Offset Strategy for the CRM in Appendix 2 of this report, DERM and DEWHA consider: ▪ that the Coordinator-General regards the general scope of the offset proposal for brigalow at Norwich Park to be acceptable ▪ that subject to verification of sufficient integrity of the proposed offset vegetation, the Coordinator-General considers that an offset of poplar box vegetation at Blackwater of at least 450 hectares would be acceptable ▪ that subject to the provision of more detailed information, the Coordinator-General	

Environmental aspect	Coordinator-General's Report reference	Requirement	Comment and suggested condition wording
		considers that the offset proposal for natural grasslands at Gregory Crinum appears to be insufficient for EPBC-listed EECs without further augmentation ▪ to avoid the risk of double-counting, the proponent delineates and quantifies in the Biodiversity Offset Strategy the areas of vegetation in each proposed offset area attributable to each phase of the Bowen Basin Coal Growth (BBCG) project ▪ the Coordinator-General's observations in section 7.3.6.3 of this report in relation to BMA's offset proposals.	
Interference with a railway	Appendix , Schedule 4, Condition 3 (a) and (b)	**Interference with a railway** (a) Approval must be obtained from railway manager prior to any interference with a railway under the *Transport Infrastructure Act 1994*. (b) If any project works are likely to interfere with the operation of railway services, consultation must be undertaken with the railway manager to identify and implement actions which will minimise disruption to railway operations.	**No change of condition wording required**

Appendix C - Correspondence from Queensland Rail

GPO Box 456
Brisbane Qld 4001 Australia
www.qrnational.com.au
13 23 32

QR NATIONAL
NETWORK SERVICES

9 November 2010

Attention: Mr. Sam Birkbeck
Bechtel Australia Pty Ltd
100 Brookes Street
Fortitude Valley QLD 4006

Dear Sir

Re: Cavil Ridge Project

I refer to the Project Drawings Revision 0 included in your transmittal No. 25578-000-G26-GGG-00519 dated the 26 October 2010 and also to your "Response to QR Comments 02-11-10" included in transmittal No. 25578-000-G26-GGG-00537 dated the 3 November 2010 and confirm that "Approval in Principal" is now given to the Horizontal and Vertical alignment as per these documents.

Regards,

Joe Majkut
Capital Delivery
Infrastructure Services
QR National

DRAWING LIST

DRAWING No.	DESCRIPTION
25578-600-CR-6310-00001	OFF-SITE INFRASTRUCTURE RAIL LOOP OVERALL PLAN
25578-600-CR-6310-00002	OFF-SITE INFRASTRUCTURE RAIL LOOP PLAN AND LONGITUDINAL SECTION - SHEET 1
25578-600-CR-6310-00003	OFF-SITE INFRASTRUCTURE RAIL LOOP PLAN AND LONGITUDINAL SECTION - SHEET 2
25578-600-CR-6310-00004	OFF-SITE INFRASTRUCTURE RAIL LOOP PLAN AND LONGITUDINAL SECTION - SHEET 3
25578-600-CR-6310-00005	OFF-SITE INFRASTRUCTURE RAIL LOOP PLAN AND LONGITUDINAL SECTION - SHEET 4
25578-600-CR-6310-00011	OFF-SITE INFRASTRUCTURE RAIL LOOP TYPICAL CROSS SECTIONS - SHEET 1
25578-600-CR-6310-00012	OFF-SITE INFRASTRUCTURE RAIL LOOP TYPICAL CROSS SECTIONS - SHEET 2

PLAN

SCALE 1:20000

NOTES:

1. REFER DRAWING No. 25578-600-CR-6310-00002 TO 00005 FOR RAIL CORRIDOR PLAN AND LONGITUDINAL SECTIONS.
2. REFER TO DRAWING No. 25578-600-CR-6300-00011 FOR TYPICAL SECTIONS.

THIS DESIGN IS SUBJECT TO QR APPROVAL

1:20000

REV. No.	DATE	REVISION	DRN	CHK	EGS	PEM	CLIENT
0	25/10/2010	INCORPORATED QR COMMENTS - ISSUED FOR DESIGN	BAC	CT	GN	PN	-

REFERENCES DRAWINGS | NUMBER | NOTES | STAMP

Bechtel Australia Pty Ltd
A.B.N. 42 006 334 5050

SCALE: 1:20000
ENG. MANAGER P. NETTUR
AREA MNG/PM D. MCKEWEN

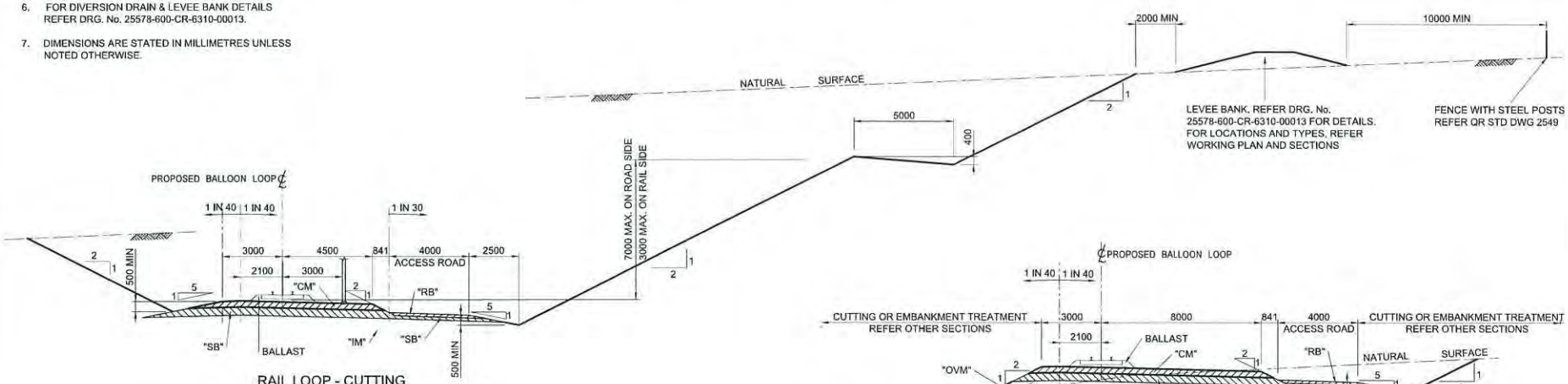
CAVAL RIDGE PROJECT - DPS
OFF-SITE INFRASTRUCTURE
RAIL LOOP EARTHWORKS
OVERALL PLAN

Job No. 25578
25578 - 600 - CR - 6310 - 00001
REV. 0

CR-6310-00001.dgn 10/25/2010 2:02:32 PM

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH QR STD DWG 2567, 2568, 2569, 2570, 2571 AND 2572.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH QR STD SPECIFICATIONS PART 2 (CLEARING AND GRUBBING), PART 5 (FOUNDATION EXCAVATION) AND PART 6 (EARTHWORKS).
3. CAPPING LAYER DESIGN FOR 20 MILLION TONNES PER YEAR, 30 YEAR DESIGN LIFE.
4. FOR SUBSOIL DRAIN AND OUTLET PIPE DETAILS REFER QR STD DWG 2569.
5. FOR FENCE DETAILS REFER QR STD DWG 2549.
6. FOR DIVERSION DRAIN & LEVEE BANK DETAILS REFER DRG. No. 25578-600-CR-6310-00013.
7. DIMENSIONS ARE STATED IN MILLIMETRES UNLESS NOTED OTHERWISE.



RAIL LOOP - CUTTING

DRAIN DEEPENS AND WIDENS TO ALLOW NOM 0.3% LONGITUDINAL FALL TO CULVERTS, REFER CROSS SECTIONS FOR LEVELS

RAIL LOOP - SIGNAL PADS

RAIL LOOP - EMBANKMENT

FORMATION MATERIAL LAYERING	
MAT'L	THICKNESS (MIN)
OVM	427 "TRUE"
CM	300
RB	150
SB	400 (150@RB)
EBF	AS REQ'D TO SUBGRADE
BALLAST	300 (POB TO CH6606.592)
	300 (CH10134.595 TO POE)
	250 (CH6606.592 TO CH10134.595)
	200 (BAD ORDER SIDING)

DIVERSION DRAIN. REFER DRG.No. 25578-600-CR-6310-00013 FOR DETAILS. FOR LOCATIONS AND TYPES, REFER WORKING PLAN AND SECTIONS

THIS DESIGN IS SUBJECT TO QR APPROVAL

DESIGN OF CAPPING LAYERS AS PER QR DESIGN

LEGEND

- "OVM" - OUTER VERGE MATERIAL
- "CM" - CAPPING MATERIAL AS PER QR DESIGN
- "RB" - ROAD BASE (CBR 35)
- "SB" - SUBBASE AS PER QR DESIGN
- "EBF" - EMBANKMENT BULK FILL MATERIALAS PER QR SPECIFICATION
- "IM" - COMPACTED INSITU MATERIAL (ALL TOPSOIL TO BE REMOVED)

1:100

Rev No.	DATE	REVISION	DRN	CHK	EGS	PEM	CLIENT
0	25/10/2010	INCORPORATED QR COMMENTS - ISSUED FOR DESIGN	BAC	CT	GN	PN	-

REFERENCES DRAWINGS | NUMBER | NOTES | STAMP

Bechtel Australia Pty Ltd
A.B.N. 42 006 334 5050

APPROVAL		DATE
BHP - BMA		DATE
PROJECT ENG.	-	-
AREA MNG.	-	-

SCALE: 1:100		DATE
DESIGNED BY	BAC	17.05.10
CHECKED	CT	17.05.10
ENG. MANAGER	P. NETTUR	-
AREA MNG/PM	D. MCKEWEN	-

Job No. 25578 | BECHTEL TRAINING N° 25578 - 600 - CR - 6310 - 00011 | REV. 0

BMA

CAVAL RIDGE PROJECT - DPS
OFF-SITE INFRASTRUCTURE
RAIL LOOP EARTHWORKS
TYPICAL SECTIONS - 1 OF 2

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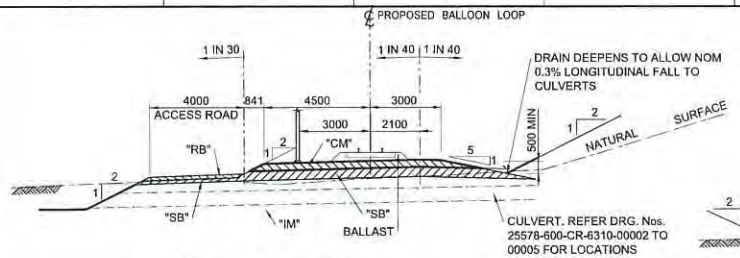
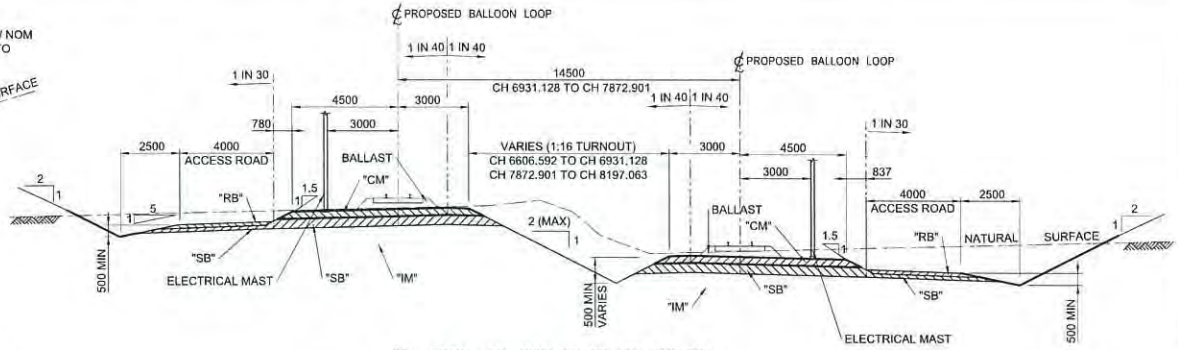
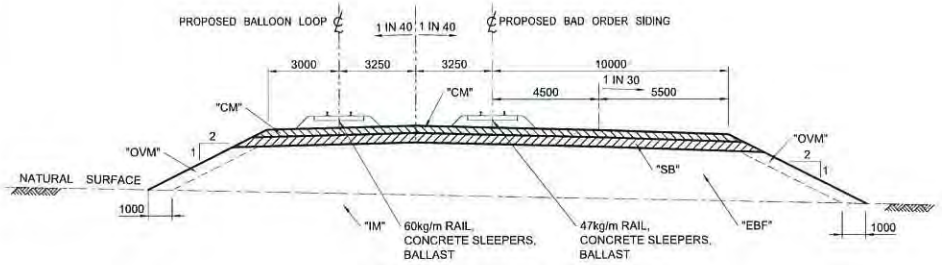


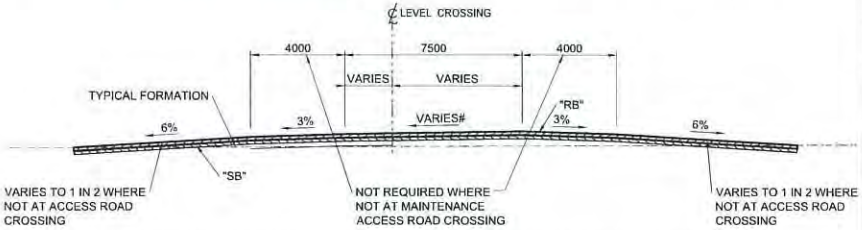
SINGLE RAIL FORMATION



RAIL LOOP - CH 6606.592 TO CH 8197.063

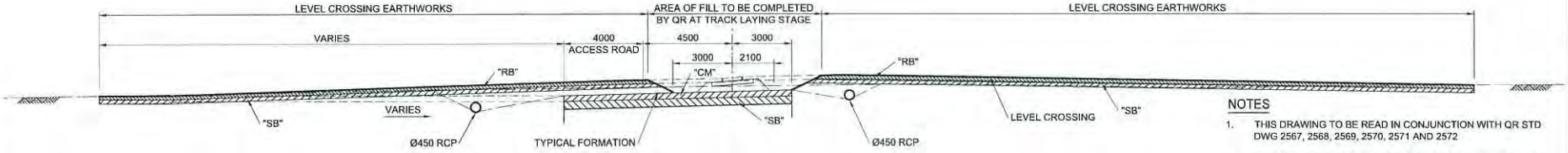


BAD ORDER SIDING - EMBANKMENT



TYPICAL CROSS SECTION MAINTENANCE ACCESS ROAD AT LEVEL CROSSING

\# 1.5% NOMINALLY, BUT CHANGE TO TRACK GRADE AT TRACK CROSSING



VEHICLE TURNOUT

LEGEND

"OVM" -	OUTER VERGE MATERIAL
"CM" -	CAPPING MATERIAL AS PER QR DESIGN
"RB" -	ROAD BASE (CBR 35)
"SB" -	SUBBASE AS PER QR DESIGN
"EBF" -	EMBANKMENT BULK FILL MATERIALAS PER QR SPECIFICATION
"IM" -	COMPACTED INSITU MATERIAL (ALL TOPSOIL TO BE REMOVED)

FORMATION MATERIAL LAYERING	
MAT'L	THICKNESS (MIN)
OVM	427 "TRUE"
CM	300
RB	150
SB	400 (150@RB)
EBF	AS REQ'D TO SUBGRADE
BALLAST	300 (POB TO CH6606.592)
	300 (CH10134.595 TO POE)
	250 (CH6606.592 TO CH10134.595)
	200 (BAD ORDER SIDING)

NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH QR STD DWG 2567, 2568, 2569, 2570, 2571 AND 2572
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH QR STD SPECIFICATIONS PART 2 (CLEARING AND GRUBBING), PART 5 (FOUNDATION EXCAVATION) AND PART 6 (EARTHWORKS).
3. CAPPING LAYER DESIGN FOR 20 MILLION TONNES PER YEAR, 30 YEAR DESIGN LIFE.
4. DIMENSIONS ARE STATED IN MILLIMETRES UNLESS NOTED OTHERWISE.

DESIGN OF CAPPING LAYERS AS PER QR DESIGN

THIS DESIGN IS SUBJECT TO QR APPROVAL

1:100

REV. No.	DATE	REVISION	ORN	CHK	EGS	PEM	CLIENT	REFERENCES DRAWINGS	NUMBER	NOTES	STAMP
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Bechtel Australia Pty Ltd
A.B.N. 42 006 334 5050

CLIENT APPROVAL			BECHTEL			
BHP - BMA		DATE	ORIGINATOR	BAC	DRAWN	BAC 17.05.10
PROJECT ENG.	-	-	DESIGNED	CT	CHECKED	GN 17.05.10
AREA MNG.	-	-	ENG. MANAGER		P. NETTUR	-
			AREA MNG/PM		D. MCKEVEN	-

SCALE: 1:100

BMA

CAVAL RIDGE PROJECT - DPS

OFF-SITE INFRASTRUCTURE
RAIL LOOP EARTHWORKS
TYPICAL SECTIONS - 2 OF 2

Job No. 25578 | BECHTEL DRAWING NO. 25578 - 600 - CR - 6310 - 00012 | REV. 0

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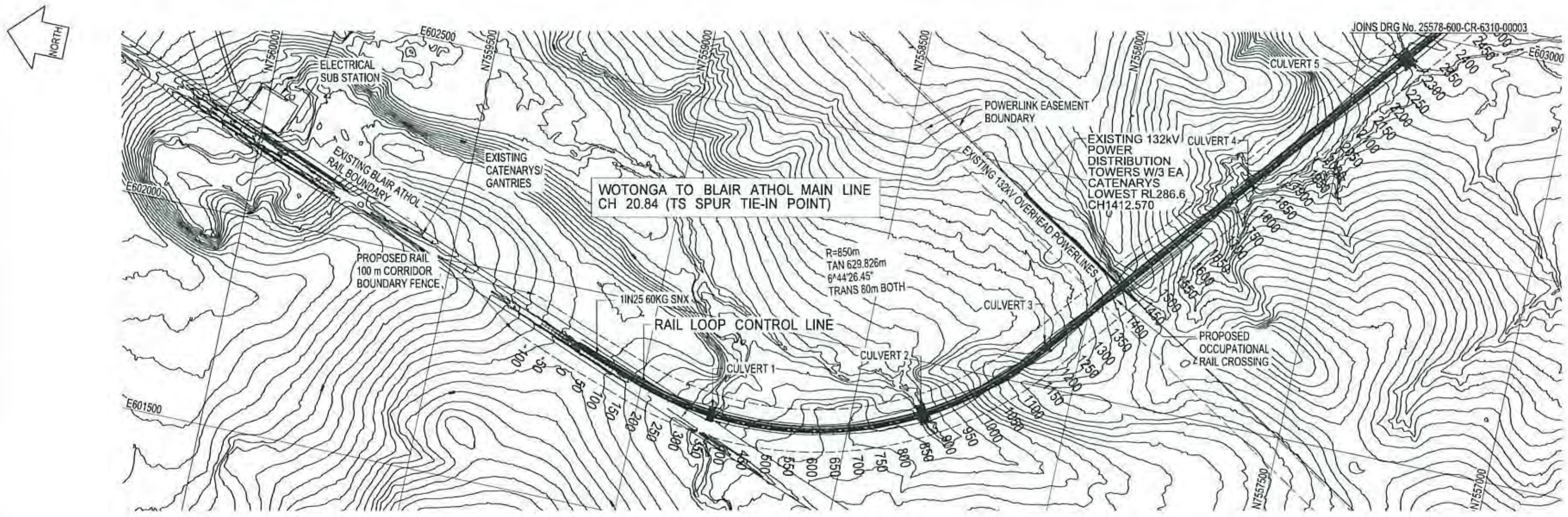
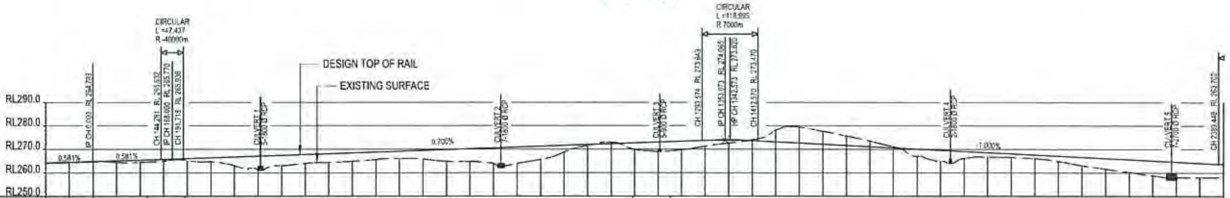


PLAN

SCALE 1:5000



HORIZ. CURVATURE: TAN = 100.00; TAN = 115.009; SL = 80.00; R = 850.000 ARC 950.980; SL = 80.00; TAN = 2505.169

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-50.000	264.333	264.503
0.000	264.624	264.793
50.000	264.393	265.084
100.000	264.406	265.375
115.010	264.538	265.462
150.000	264.908	265.666
195.010	265.330	265.959
200.000	265.200	265.994
250.000	264.653	266.344
300.000	263.018	266.694
350.000	261.176	267.044
400.000	263.000	267.394
450.000	263.954	267.744
500.000	264.357	268.094
550.000	264.818	268.444
600.000	265.603	268.794
650.000	266.000	269.144
700.000	265.743	269.494
750.000	264.837	269.844
800.000	264.735	270.194
850.000	263.958	270.544
900.000	263.852	270.894
950.000	265.607	271.244
1000.000	268.768	271.594
1050.000	271.604	271.944
1100.000	273.000	272.294
1145.990	270.031	272.616
1150.000	269.861	272.644
1200.000	269.037	272.994
1225.990	269.290	273.176
1250.000	269.757	273.344
1300.000	271.264	273.691
1350.000	272.580	273.817
1400.000	274.000	273.585
1450.000	278.149	273.096
1500.000	279.412	272.596
1550.000	277.668	272.096
1600.000	275.649	271.596
1650.000	273.457	271.096
1700.000	271.143	270.596
1750.000	267.000	270.096
1800.000	265.000	269.596
1850.000	266.128	269.096
1900.000	266.697	268.596
1950.000	266.559	268.096
2000.000	266.077	267.596
2050.000	264.797	267.096
2100.000	263.066	266.596
2150.000	261.630	266.096
2200.000	260.232	265.596
2250.000	258.793	265.096
2300.000	258.000	264.596
2350.000	258.000	264.096
2400.000	258.000	263.600

LONGITUDINAL SECTION RAIL LINE CH 0.000 TO CH 2400.000

SCALE 1:5000 HORIZONTAL
SCALE 1:1000 VERTICAL

THIS DESIGN IS SUBJECT TO QR APPROVAL

NOTES:

1. REFER DRAWING No. 25578-600-CR-6310-00001 FOR DRAWING SHEET LAYOUTS.
2. CULVERT OUTLET WORKS WILL BE REQUIRED OUTSIDE OF THE INDICATED RAIL CORRIDOR.

HORIZONTAL DATUM: AMG zone 55, AGD66. VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM (AHD)

Rev. No.	DATE	REVISION	DRN	CHK	EGS	PEM	CLIENT
0	25/10/2010	INCORPORATED QR COMMENTS - ISSUED FOR DESIGN	BAC	CT	GN	PN	-

Bechtel Australia Pty Ltd
A.B.N. 42 006 334 5050

SCALE N.T.S.

APPROVAL		DATE
BHP - BMA		
PROJECT ENG.	-	-
AREA MNG.	-	-

		DATE
	BAC	17.05.10
	CT	17.05.10
ENG. MANAGER	P. NETTUR	-
AREA MNG/PM	D. MCKEWEN	-

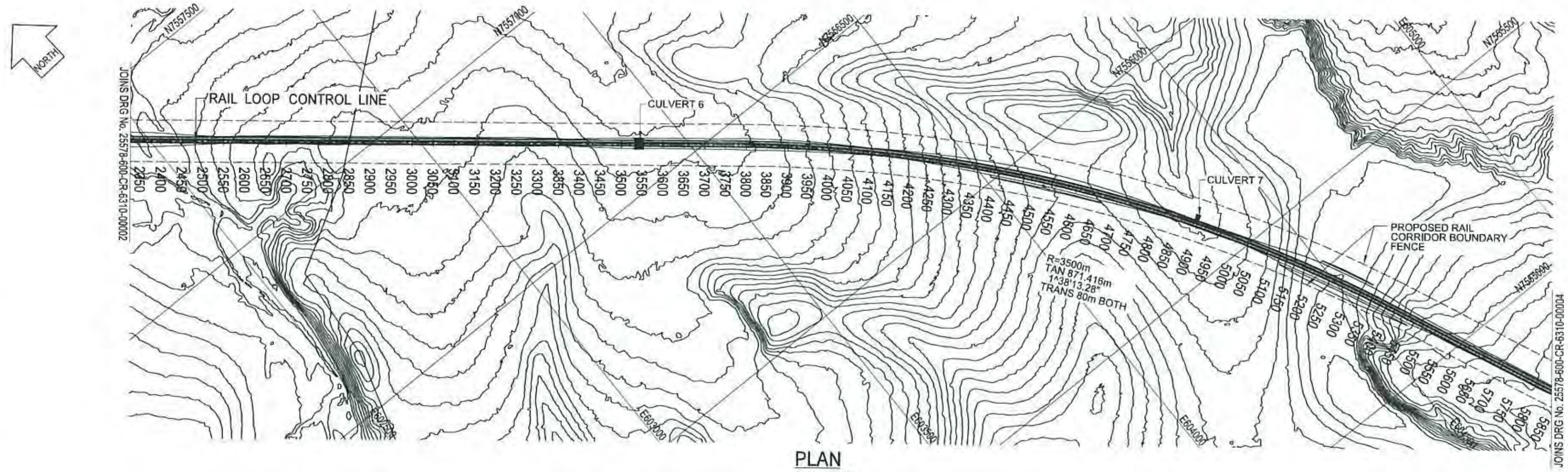
Job No. 25578

25578 - 600 - CR - 6310 - 00002

CAVAL RIDGE PROJECT - DPS
OFF-SITE INFRASTRUCTURE
RAIL LOOP EARTHWORKS
PLAN & LONGITUDINAL SECTION - 1 OF 4

REV. 0

CR 6310 00002.dgn 10/26/2010 2:07:41 PM



PLAN

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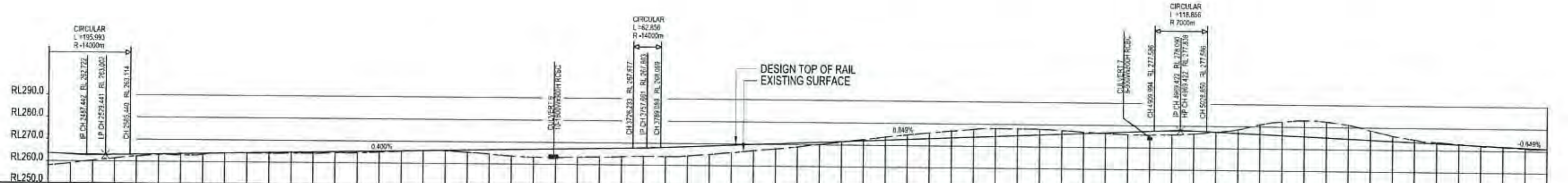

HORIZ. CURVATURE: TAN = 2505.169 | SL = 80.00 | R = 3500.000, ARC 1552.539 | SL = 80.00 | TAN = 761.661

CHAINAGE	EXISTING SURFACE	DESIGN TOP OF RAIL
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2500.000	260.395	263.033
2550.000	261.531	263.017
2600.000	262.413	263.172
2650.000	263.144	263.372
2700.000	263.000	263.572
2750.000	263.323	263.772
2800.000	264.000	263.972
2850.000	264.000	264.172
2900.000	264.000	264.372
2950.000	264.196	264.572
3000.000	264.216	264.772
3050.000	264.409	264.972
3100.000	264.568	265.172
3150.000	264.950	265.372
3200.000	265.399	265.572
3250.000	265.759	265.772
3300.000	265.708	265.972
3350.000	265.193	266.172
3400.000	264.497	266.372
3450.000	263.705	266.572
3500.000	263.254	266.772
3550.000	263.246	266.972
3600.000	263.460	267.172
3650.000	263.567	267.372
3700.000	263.815	267.572
3731.159	264.000	267.698
3750.000	264.000	267.792
3800.000	264.000	268.162
3811.159	264.000	268.257
3850.000	264.411	268.587
3900.000	265.117	269.011
3950.000	266.000	269.436
4000.000	267.000	269.860
4050.000	267.934	270.285
4100.000	268.888	270.709
4150.000	270.111	271.134
4200.000	271.242	271.558
4250.000	272.518	271.983
4300.000	273.791	272.407
4350.000	274.820	272.832
4400.000	275.839	273.256
4450.000	276.756	273.681
4500.000	277.621	274.105
4550.000	278.000	274.530
4600.000	278.000	274.954
4650.000	277.964	275.379
4700.000	277.471	275.803
4750.000	276.906	276.228
4800.000	276.336	276.652
4850.000	275.972	277.077
4900.000	275.833	277.501
4950.000	276.000	277.843
5000.000	276.559	277.845
5050.000	277.381	277.507
5100.000	278.621	277.083
5150.000	280.964	276.658
5200.000	282.385	276.234
5250.000	283.000	275.809
5300.000	282.510	275.385
5350.000	281.134	274.960
5363.698	280.586	274.844
5400.000	278.724	274.536
5443.698	276.663	274.165
5450.000	276.367	274.111
5500.000	274.755	273.687
5550.000	273.768	273.262
5600.000	273.036	272.838
5650.000	272.163	272.413
5700.000	271.712	271.989
5750.000	271.159	271.564
5800.000	270.936	271.140

LONGITUDINAL SECTION RAIL LINE CH 2400.000 TO CH 5800.000

SCALE 1:5000 HORIZONTAL
SCALE 1:1000 VERTICAL

NOTES:

1. REFER DRAWING No. 25578-600-CR-6310-00001 FOR DRAWING SHEET LAYOUTS.
2. CULVERT OUTLET WORKS WILL BE REQUIRED OUTSIDE OF THE INDICATED RAIL CORRIDOR.

THIS DESIGN IS SUBJECT TO QR APPROVAL

REV. No	DATE	REVISION	DRN	CHK	EGS	PEM	CLIENT
0	25/10/2010	INCORPORATED QR COMMENTS - ISSUED FOR DESIGN	BAC	CT	GN	PN	-

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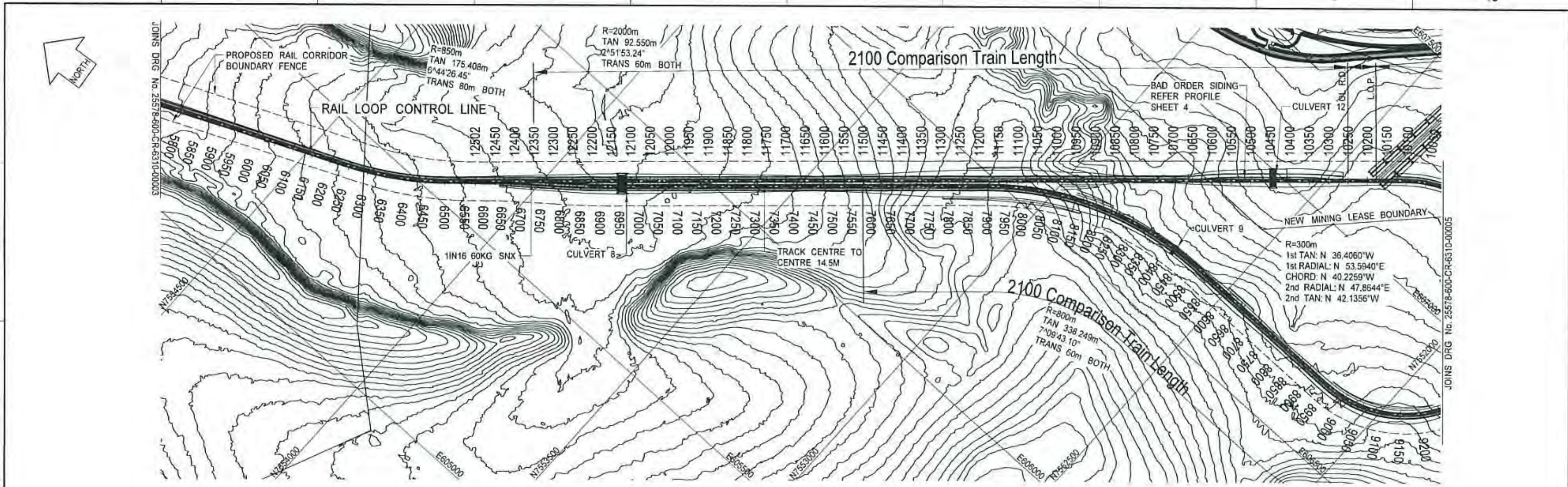
A.B.N. 42 006 334 5050

SCALE N.T.S. — DRAWN BAC MC 17.05.10 — CHECKED CT GV 17.05.10 — ENG. MANAGER P NETTUR — AREA MNG/PM D. MCKEWEN

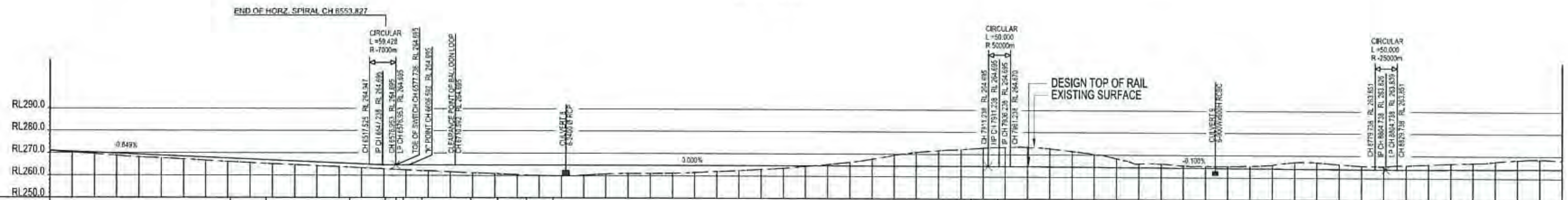
CAVAL RIDGE PROJECT - DPS
OFF-SITE INFRASTRUCTURE
RAIL LOOP EARTHWORKS
PLAN & LONGITUDINAL SECTION - 2 OF 4

Job No. 25578 — 25578 - 600 - CR - 6310 - 00003 — REV 0



PLAN

SCALE 1:5000



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5900.000	269.547	270.291
5950.000	268.843	269.866
6000.000	268.176	269.442
6050.000	267.768	269.017
6100.000	267.276	268.593
6150.000	266.689	268.168
6200.000	266.096	267.744
6205.358	266.036	267.698
6250.000	265.614	267.319
6285.358	265.266	267.019
6300.000	265.106	266.895
6350.000	264.725	266.470
6400.000	264.267	266.046
6450.000	263.867	265.621
6473.827	263.608	265.419
6500.000	263.354	265.197
6550.000	262.930	264.802
6553.827	262.885	264.782
[illegible]	262.604	264.704
[illegible]	262.443	264.695
[illegible]	262.379	264.695
6626.396	262.130	264.695
[illegible]	[illegible]	[illegible]
6642.931	262.000	264.695
6650.000	262.000	264.695
6700.000	261.564	264.695
6746.074	261.215	264.695
6750.000	261.166	264.695
6800.000	260.854	264.695
6806.074	260.802	264.695
6850.000	260.427	264.695
6871.128	260.248	264.695
6900.000	260.018	264.695
6931.128	260.000	264.695
6950.000	260.000	264.695
7000.000	260.255	264.695
7050.000	260.773	264.695
7100.000	261.000	264.695
7150.000	261.000	264.695
7200.000	261.158	264.695
7250.000	261.507	264.695
7300.000	261.997	264.695
7350.000	262.393	264.695
7400.000	262.949	264.695
7450.000	263.588	264.695
7500.000	264.384	264.695
7550.000	265.288	264.695
7600.000	266.361	264.695
7650.000	267.805	264.695
7700.000	269.556	264.695
7750.000	270.933	264.695
7800.000	271.671	264.695
7850.000	272.224	264.695
7872.901	272.534	264.695
7900.000	272.963	264.695
7932.901	273.291	264.690
7950.000	273.337	264.680
8000.000	273.325	264.631
8050.000	272.769	264.581
8100.000	271.589	264.531
8150.000	270.420	264.481
8200.000	268.383	264.431
8250.000	266.119	264.381
8300.000	266.042	264.331
8350.000	265.283	264.281
8400.000	265.216	264.231
8450.000	265.060	264.181
8461.225	265.120	264.170
8500.000	265.299	264.131
8521.225	265.413	264.110
8550.000	265.793	264.081
8600.000	267.092	264.031
8650.000	266.987	263.981
8700.000	266.181	263.931
8750.000	265.446	263.881
8800.000	265.319	263.839
8850.000	265.764	263.872
8900.000	266.165	263.922
8911.441	266.275	263.933
8950.000	266.648	263.972
8971.441	266.857	263.993
9000.000	266.896	264.022
9050.000	267.592	264.072
9100.000	268.353	264.122
9150.000	268.633	264.172
9200.000	268.044	264.222

LONGITUDINAL SECTION RAIL LINE CH 5800.000 TO CH 9200.000

SCALE 1:5000 HORIZONTAL
SCALE 1:1000 VERTICAL

NOTES:

1. REFER DRAWING No. 25578-600-CR-6310-00001 FOR DRAWING SHEET LAYOUTS.
2. CULVERT OUTLET WORKS WILL BE REQUIRED OUTSIDE OF THE INDICATED RAIL CORRIDOR.

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REV. No.	DATE	REVISION	DRN	CHK	EGS	PEM	CLIENT
0	25/10/2010	INCORPORATED QR COMMENTS - ISSUED FOR DESIGN	BAC	CT	GN	PN	-

Bechtel Australia Pty Ltd
A.B.N. 42 006 334 5050

CLIENT: BHP - BMA; PROJECT ENG.; AREA MNG
SCALE: N.T.S.; DESIGNED BY BAC; DRAWN MC 17.05.10; CHECKED BY CT; GN 17.05.10; ENG. MANAGER P. NETTUR; AREA MNG/PM D. MCKEWEN

Job No. 25578

25578 - 600 - CR - 6310 - 00004 REV 0

CAVAL RIDGE PROJECT - DPS
OFF-SITE INFRASTRUCTURE
RAIL LOOP EARTHWORKS
PLAN & LONGITUDINAL SECTION - 3 OF 4

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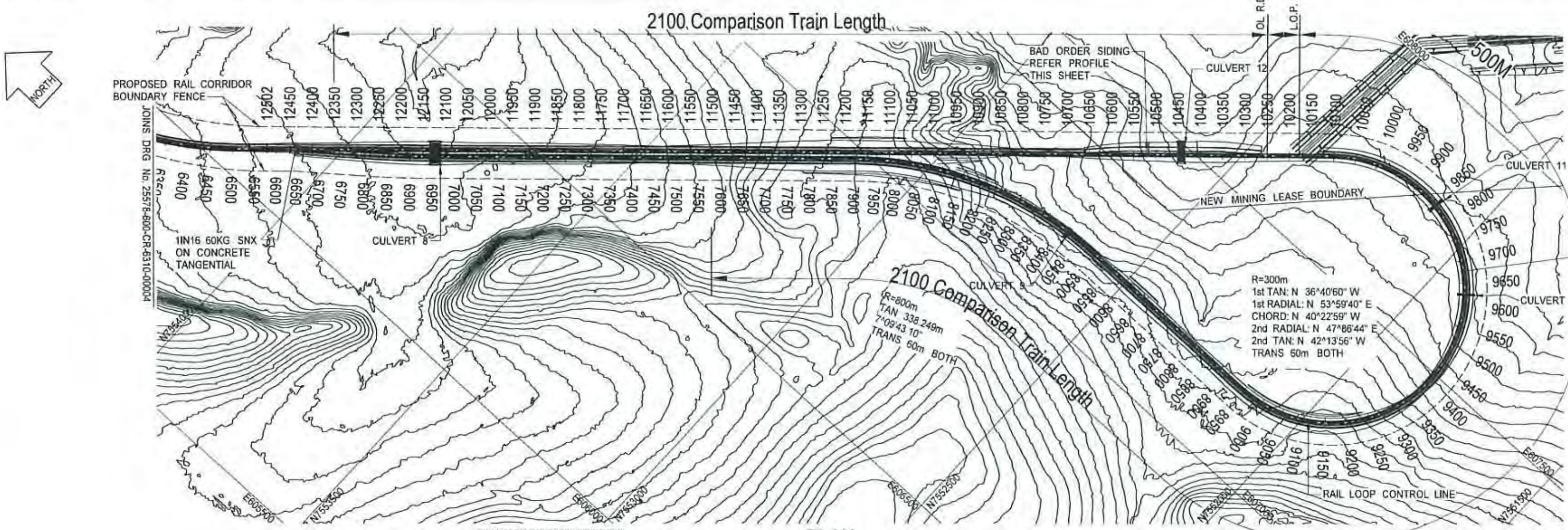
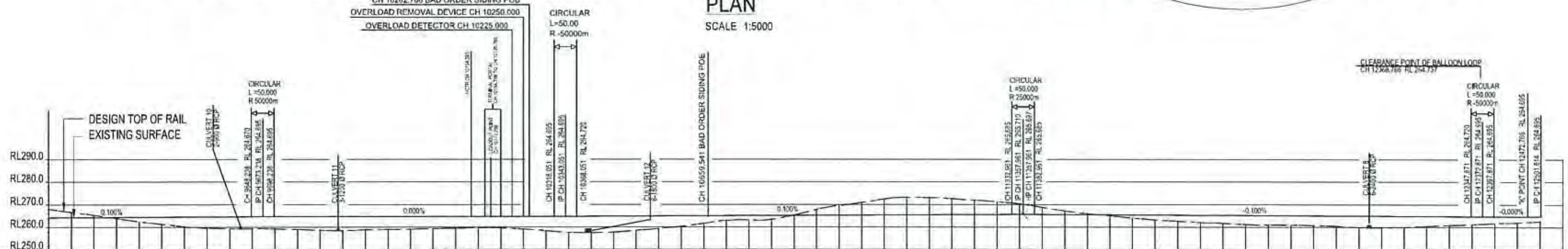


PLAN
SCALE 1:5000



CHAINAGE	DESIGN TOP OF RAIL	EXISTING SURFACE
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9350.000	264.372	263.913
9400.000	264.422	262.510
9450.000	264.472	261.338
9500.000	264.522	260.187
9550.000	264.572	259.706
9600.000	264.622	259.431
9650.000	264.672	259.420
9700.000	264.695	259.301
9750.000	264.695	259.006
9800.000	264.695	258.725
9850.000	264.695	258.527
9900.000	264.695	258.841
9950.000	264.695	259.003
10000.000	264.695	259.187
10050.000	264.695	259.388
10074.540	264.695	259.496
10100.000	264.695	259.609
10134.540	264.695	259.739
10150.000	264.695	259.769
10200.000	264.695	259.758
10250.000	264.695	259.205
10300.000	264.695	258.429
10350.000	264.705	257.734
10400.000	264.752	257.580
10450.000	264.802	257.816
10500.000	264.852	258.556
10550.000	264.902	259.389
10600.000	264.952	260.357
10650.000	265.002	261.653
10700.000	265.052	263.000
10750.000	265.102	263.128
10800.000	265.152	263.410
10850.000	265.202	265.294
10900.000	265.252	267.832
10950.000	265.302	269.511
11000.000	265.352	270.889
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11100.000	265.452	273.167
11150.000	265.502	273.066
11200.000	265.552	272.575
11250.000	265.602	272.000
11300.000	265.652	271.230
11350.000	265.696	270.254
11400.000	265.668	268.785
11450.000	265.618	267.175
11500.000	265.568	265.981
11550.000	265.518	265.000
11600.000	265.468	264.029
11650.000	265.418	263.198
11700.000	265.368	262.660
11750.000	265.318	262.097
11800.000	265.268	261.725
11850.000	265.218	261.243
11900.000	265.168	261.000
11950.000	265.118	260.987
12000.000	265.068	260.837
12050.000	265.018	260.470
12100.000	264.968	260.000
12150.000	264.918	259.878
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12300.000	264.768	260.932
12350.000	264.718	261.277
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12450.000	264.695	262.083
12500.000	264.695	262.587
12501.617 / 12550.000		262.604

HORIZ. CURVATURE: R = 300.000, ARC 1103.099; SL = 60.00; TAN = 2367.077

NOTES:

1. REFER DRAWING No. 25578-600-CR-6310-00001 FOR DRAWING SHEET LAYOUTS.
2. CULVERT OUTLET WORKS WILL BE REQUIRED OUTSIDE OF THE INDICATED RAIL CORRIDOR.

LONGITUDINAL SECTION RAIL LINE CH 9200.000 TO CH 12439.170

SCALE 1:5000 HORIZONTAL
SCALE 1:1000 VERTICAL

THIS DESIGN IS SUBJECT TO QR APPROVAL

REV. No	DATE	REVISION	DRN	CHK	EGS	PEM	CLIENT
0	25/10/2010	INCORPORATED QR COMMENTS - ISSUED FOR DESIGN	BAC	CT	GN	PN	

Bechtel Australia Pty Ltd
A.B.N 42 006 334 5050

APPROVAL: BHP - BMA; PROJECT ENG.; AREA MNG.
SCALE: N.T.S — BAC MC 17.05.10; TC GN 17.05.10; ENG. MANAGER PN; AREA MNG/PM DM

CAVAL RIDGE PROJECT - DPS
OFF-SITE INFRASTRUCTURE
RAIL LOOP EARTHWORKS
PLAN & LONGITUDINAL SECTION - 4 OF 4

Job No. 25578
25578 - 600 - CR - 6310 - 00005
REV. 0

CR-6310-00005.dgn 10/26/2010 2:12:14 PM

Appendix D – Technical assessment addressing soil resources (GSS Environmental, 2010)

APPENDIX B - SOIL RESOURCES (GSS Environmental, 2010)

Summary of Comparison of changes to Soil and Land Assessment

Factor	Rail Alignment	Revised Rail Alignment
Major Land System	Durrandella Occurs on weathered Tertiary and Permian rocks and is typically distinguished by hills with lancewood and narrow-leaved ironbark.	No change
Minor Land system	nil	Daunia Weathered and fresh Permian shales and lithic sandstones.
Geology (1:100,000 scale)	Approximately 80% underlain by undifferentiated Tertiary sediments (Czr); and Approximately 20% is underlain by Permian sediments (Pb) of the Back Creek Group.	Approximately 50% underlain by undifferentiated Tertiary sediments (Czr); and Approximately 50% underlain by Permian sediments (Pb) Back Creek Group. Conclusion, no major change in geology.
Elevation	250-300m	No change
Major vegetation group	Savannah Woodland : box and ironbark	Savannah Woodland of box and ironbark with some Brigalow vegetation associated with Soil Type C2. Conclusion, no major change in vegetation.
Soil Types	Two soil types cover the rail alignment area (1) Soil Type R2 which is a shallow rocky soil covering 81% or 49 ha, (2) Soil Type C1a which is a Yellow-Brown Duplex soil covering 19% or 11 ha. Refer **Figure 1**.	Three soil types cover the rail realignment area (1) Soil Type R2, (2) Soil Type C1a, and Soil Type C2. The rail realignment route has altered the relative proportion of Soil Type R2 to Soil Type C1 with a small addition of Soil Type C2. Note: the total area to be disturbed on the sites western edge by the rail realignment has increased from approx. 60 ha to 102 ha. Of this 102 ha, Soil Type R2 covers 32% (32 ha) and Soil Type C1 covers 65% (66 ha) with an additional pocket of Soil Type C2 covering 3% (<4 ha) (**Figure 1**). Conclusion, no major changes to soil types as terrain is essentially the same.
Agricultural Land Class (ALC)	Two ALC classes occur in the rail alignment area (1) ALC Class C3 which is associated Soil Type R2 (covers 81% of area), and (2) ALC Classes C1 which is associated Soil Type C1 (covers 19% of area).	Two ALC classes occur in the rail realignment area (1) ALC Class C3 which is associated Soil Type R2 (covers 32% of area), and (2) ALC Class C1 which is associated Soil Types C1a and C2 (covers 68% of area). Conclusion, minor relative change will occur with regards to the proportion of ALC classes to be disturbed by the rail realignment.
Good Quality Agricultural Land Class (GQAL)	In Belyando Shire, ALC Class C1 land is considered GQAL and as such, 19% of the rail alignment area was classified as GQAL.	In Belyando Shire, ALC Class C1 land is considered GQAL and as such, 68% of the rail alignment area is classified as GQAL. Conclusion, minor relative change in will occur with regards to the proportion of GQAL classes to be disturbed by the rail realignment.

Note: Figure 1 has been replaced by PB Figure 6-1 (Soil Classification) in Caval Ridge Change Request 3.

Soil Types Overview

Soil Type #	Code	Description
1	R2a	Skeletal soil from Permian and weathered Tertiary (Shotover) The Shotover soil type is a shallow rocky soil that covers the sandstone ridges and hills in the rail realignment area. This soil is typically a shallow uniform coarse textured soil with an acidic reaction trend. On Figure 1, this soil is denoted as R2a to show that this soil is a variant of Soil Type R2 due to a shallower and rockier solum.
	R2b	Skeletal soil from Basalt (Rugby) The Rugby soil type is a shallow coarse to medium textured soil with a slightly acidic to neutral soil reaction trend. This soil is similar to the Shotover soil and covers similar topography, however, it has developed from basalt rocks rather than Permian or weathered Tertiary material. On Figure 1, this soil is denoted as R2b to show that its development has been influenced by basaltic parent material.
2	C1a	Yellow-Brown Duplex soil (Luxor) The Luxor soil type is a dark-brown to reddish-brown sand to sandy loam overlying a grey-brown to yellowish-brown or reddish–brown moderately acidic to alkaline clayey subsoil; mottling is common as drainage is poor. The slopes angle is typically <5% with a covering of box woodland with sparse grasses. As the landform grades into foot slope positions topsoil bleaching may be present, subsoil layers contain more clay with a greater alkaline trend, and vegetation coverage can include blackbutt-brigalow communities in addition to box woodland. Where the rail realignment crosses creeks, the soil remains a texture contrast soil, however, due to its lower landscape position it contains a sandier surface and would be able to support blackbutt-brigalow vegetation communities. On Figure 1, this soil is denoted as C1a with the creek crossings shown. It is denoted as C1a as this duplex soil is a variant of Soil Type C1 found on the lower slopes.
	C2	Cracking Clay (Pegunny) The Pegunny soil type occurs in two small pockets in the rail realignment's southern area and is named Soil Type C2 as described in the SEIS. It occurs in some plains and depressions. It is a uniform medium to heavy clay soil which is usually accompanied by developed micro-relief. Topsoil is usually dark grey-brown, but reddish-brown may also occur, mottling is common in the subsoil and the surface typically has scattered billy and sandstone surface gravel. On Figure 1, this soil is denoted as Soil Type C2.

Note: Figure 1 has been replaced by PB Figure 6-1 (Soil Classification) in Caval Ridge Change Request 3.

Appendix E – Technical assessment addressing surface water and groundwater resources (PB, 2010)

MEMO

Date:	2 December 2010
To:	Craig Bancroft (Senior Environmental Advisor – BHP Billiton Mitsubishi Alliance)
Copy:	N/A
From:	Anthony Gaffney, Senior Water Engineer
Job no:	2148829A_Caval_Ridge_Post_EIS
Subject:	**Caval Ridge Change Request 3 – Review of revised rail spur and loop alignment – Water (surface and ground water)**

Parsons Brinckerhoff Australia Pty Limited
ABN 80 078 004 798

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Certified to ISO 9001, ISO 14001, AS/NZS 4801

A+ GRI Rating: Sustainability Report 2009

1. Introduction

Part of the Change Request to support changes to the CRM Project proposed by BMA includes the change to alignment of rail infrastructure (rail spur and loop), which is to be connected from the existing Blair Athol Line to the train load out (TLO) facility within the CRM site.

This memo provides the associated environmental impacts and recommended mitigation measures in relation to the surface water and groundwater components only, to allow the Coordinator General to appropriately evaluate the proposed changes and provide an approval to BMA.

2. Assessment of proposed changes

2.1 Surface Water

The proposed change to the alignment of the rail spur and loop has minimal impact in terms of surface water impacts when compared to those identified in the EIS and Supplementary EIS. For the purposes of this memo, it is assumed that the TLO facility remains as described in the EIS (i.e. no change of location).

The new alignment crosses Horse Creek upstream of the Horse Creek crossing identified in the EIS (i.e. inside ML70403).

The rail loop is now located north-west of the TLO facility and does not intersect Caval Creek.

Table 1 quantifies the geometry of the proposed change.

Table 1 Proposed geometry changes

Rail spur and loop	EIS	Proposed Change	Increase (+) / decrease (-)
Total length (km)	17.08 km	12.50 km	- 4.58 km
Corridor width (m)	100.00 m	100.00 m	no change
Length, outside Mine Lease (km)	6.35 km	11.65 km	+ 5.30 km
Length, inside Mine Lease (km)	10.74 km	0.08 km	- 10.66 km
Area, outside Mine Lease (ha)	62.38 ha	102.58 ha	+ 40.20 ha
Area, inside Mine Lease (ha)	93.01 ha	8.49 ha	- 84.52 ha

There is an increase in land area outside the mine lease required to accommodate the new rail alignment and rail loop, however the corridor width remains the same. The natural topography of the new alignment will require cross drainage structures (i.e. culverts) to allow for natural overland drainage paths (as required in the EIS). The additional length of railway may require additional cross drainage structures.

The following outlines the potential impacts in terms of surface water:

- Flood assessment Horse Creek – the hydraulic model extents for the flood assessment undertaken for the EIS does not include the alternative rail alignment. The rail alignment crosses Horse Creek immediately west of the EIS crossing and upstream of any creek diversion. The EIS assessment indicates that all flows up to and including the Q100 (i.e. ARI 100 year design event) are contained within the Horse Creek and therefore no impact to the floodplain is expected. Remodelling of the Horse Creek catchment to include the new rail alignment is not necessary, however if there is an opportunity to undertake a revision of the flood model, then the model should be extended to include the new railway alignment.

- Flood assessment Caval Creek – the alternative rail spur and loop alignment does not cross Caval Creek and therefore no additional impacts are expected. The TLO facility remains in the same location as that in the EIS and therefore any impacts associated with the TLO facility remain current.

- Construction phase – the identified impacts and mitigation measures contained in the EIS still apply to the new rail alignment. This includes earth moving activities, works adjacent to / within drainage lines, contaminant mobilisation, pollution, flooding and water supply (for dust suppression, soil compaction and wash down facilities).

- Commissioning phase – the alternative rail alignment does not relate directly to the commissioning phase of the mine.

- Operational phase – the mitigation measures implemented for the transportation of coal (i.e. potential spillage of coal into Horse Creek) will reduce any expected risk and minimise damage in case of failure.

2.2 Groundwater

The geology of the rail line relocation is mainly the Late Permian Back Creek Group (German Creek Formation) with small section of tertiary undifferentiated sediments.

Generally, the tertiary sediments (silts and clays) are densely compacted, hard and generally dry. Potential for groundwater exists within sandy and gravely sections of the sediment pile, and represents an unconfined to confined aquifer depending on location. Recharge to the Tertiary sediment aquifers is likely to come from surface infiltration of rainfall and overland flow.

Primary porosity in the Permian strata is limited and flow in this unit is likely to be predominantly via fracture flow. Recharge from rainfall would be limited due to the overlying tertiary formations (clay).

The relocation of the rail line and loop has minimal impact on groundwater. The infrastructure is at ground level with minor cut and fill areas (to optimise the vertical alignment of the rail), which will not influence natural groundwater recharge or regional flow patterns.

No additional groundwater monitoring is required to either establish a baseline or within the on-going groundwater monitoring program.

3. Comparison of impacts

The changes to the key environmental impacts over the course of the EIS process (including the Supplementary EIS (SEIS)) are presented in Table 2.

Table 2 Comparison of environmental impacts identified by the EIS and SEIS

Environmental impact	Status in EIS	Status in SEIS	Proposed change
Flood Assessment – Horse Creek	Flood assessment for Horse Creek undertaken with upstream and downstream boundaries being the defined project site. Q50 and Q100 flood extents provided.	No change, clarification provided in SEIS.	Flood assessment does not include new rail alignment as this is outside the original defined site boundary. Minimal impact to be expected. Further work in detailed design is required to quantify these impacts, if any.
Flood Assessment – Caval Creek	Caval Creek flood levels are contained within the channel banks, except at the junction of Caval and Cherwell Creek.	No change, clarification provided in SEIS.	No change due to new rail alignment
Water Quality	Baseline water quality data provided for Horse Creek and tributaries (4 water quality sites in total). No specific water quality monitoring for Caval Creek.	No change, clarification provided in SEIS.	No change due to new rail alignment

Environmental impact	Status in EIS	Status in SEIS	Proposed change
Creek diversions	Diverts Horse Creek flows adjacent to the haul road that runs along the length of the proposed open cut pit and along the mining lease boundary.	No change, clarification provided in SEIS.	No change due to new rail alignment
Construction phase	No specific impacts noted	No change, clarification provided in SEIS.	No change due to new rail alignment
Commissioning phase	No specific impacts noted	No change, clarification provided in SEIS.	No change due to new rail alignment
Operational phase	No specific impacts noted	No change, clarification provided in SEIS.	No change due to new rail alignment
Groundwater recharge	No issues relating to the rail line	No change	No change, although rail alignment and loop has moved
Groundwater monitoring	No specific rail line monitoring required	No change	No change, although rail alignment and loop has moved
Regional groundwater levels	13 registered bores within 10 km of site boundary – none of which are located near the rail line – therefore assume no or localised impact	No change	No change

4. Conclusions

4.1 Surface Water

The re-alignment of the rail corridor and rail loop has no additional environmental impacts in terms of surface water. The proposed mitigation measures contained in the EIS, Supplementary EIS and the Coordinator General's report remain un-changed.

4.2 Groundwater

The re-alignment of the rail corridor and rail loop has no additional environmental impacts in terms of groundwater. The proposed mitigation measures contained in the EIS, Supplementary EIS and the Coordinator General's report remain un-changed.

Yours sincerely

Anthony Gaffney
Senior Water Engineer
Parsons Brinckerhoff Australia Pty Limited

Appendix F – Technical assessment addressing terrestrial and aquatic ecology (PB, 2010)

MEMO

Date:	2 December 2010
To:	Craig Bancroft (Senior Environmental Advisor – BHP Billiton Mitsubishi Alliance)
Copy:	N/A
From:	Anjeanette Schimpf (Senior Environmental Scientist – Environmental Assessment and Management Team)
Job no:	2148829A_Caval_Ridge_Post_EIS
Subject:	**Caval Ridge Change Request 3 – Review of revised rail spur and loop alignment – Ecology (terrestrial and aquatic)**

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A+ GRI Rating: Sustainability Report 2009

1. Introduction

1.1 Background

BHP Billiton Mitsubishi Alliance (BMA) proposes to develop the Caval Ridge Mine (CRM). The CRM is located north of the existing Peak Downs Mine, approximately 6 km south of Moranbah township and approximately 170 km south-west of Mackay. The CRM comprises a new coal mine with an expected working life of approximately 30 years, coal handling and processing infrastructure. There will also be ancillary accommodation and services to support the BMA workforce.

The CRM Project is part of BMA's broader Bowen Basin Coal Growth Project (BBCGP), which is a significant project under the *State Development and Public Works Organisation Act 1971*.

1.2 Caval Ridge Mine Project

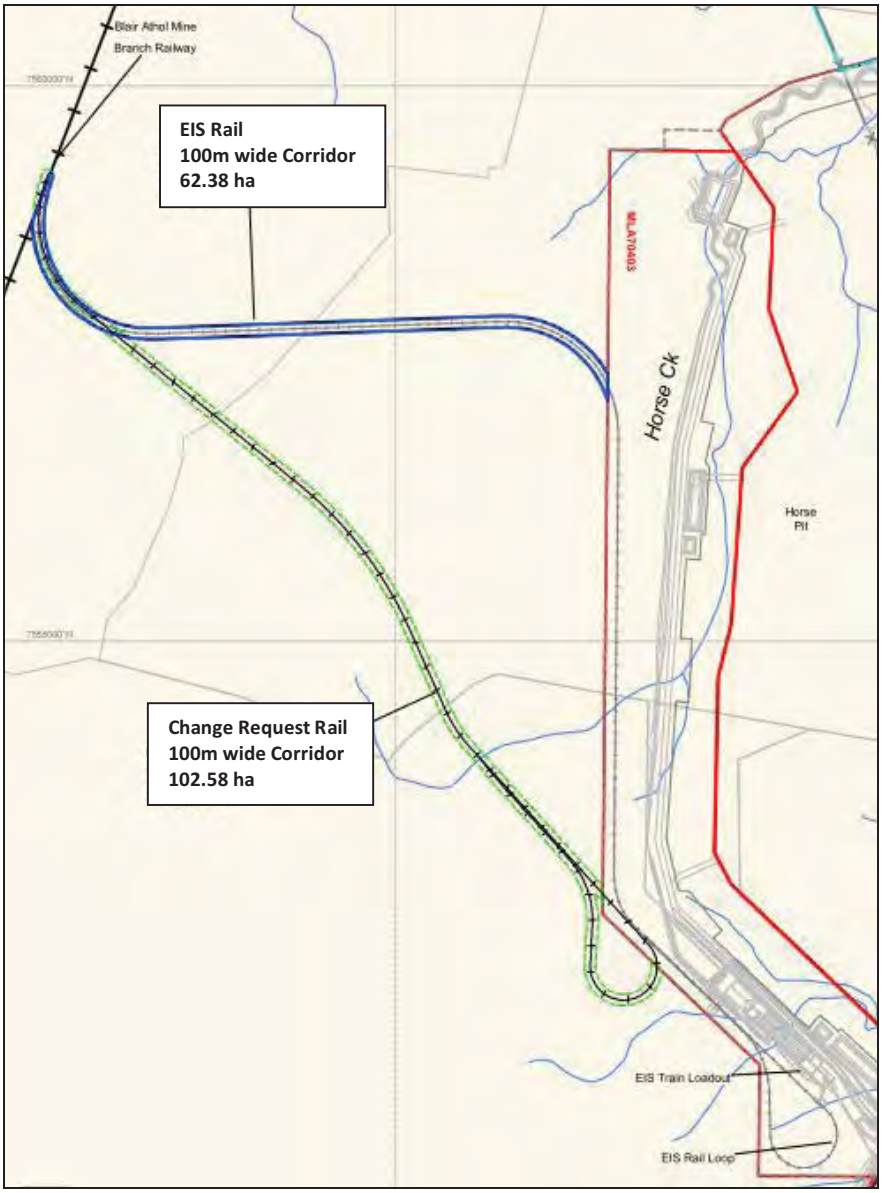
The CRM is proposed as a new open cut coal mine north of, and adjacent to, BMA's existing Peak Downs Mine. The CRM is approximately 17 km in length and 4 km in width. The site is adjoined by the Peak Downs Highway.

The CRM covers the northern extent of the BMA Mining Lease (ML1775). A new mining lease application (ML70403), immediately to the west of ML1775, will be used for the site infrastructure and supporting activities. The proposed CRM will be located on both ML1775 and the new mining lease, once approved.

An EIS was prepared for the CRM Project and released for public and advisory agency comment between July and August 2009. The Coordinator General's Report was released in August 2009, which reflected the outcome of the Coordinator General's assessment of the EIS.

1.3 Changes to rail infrastructure

Since completion of the EIS and Supplementary EIS (SEIS) for the Caval Ridge Mine, BMA have developed an alternative alignment for the rail spur and loop (refer to Figure 1 below). The amended design diverts south-east from the Blair Athol Line to the rail loop and the TLO facility on ML70403. The TLO facility and part of the rail loop (850 m) is situated within the area of disturbance assessed as part of the EIS, and as such has not been assessed for inclusion in this Change Request.



Source: URS, 2010

Figure 1: EIS rail alignment (blue) and proposed change to rail alignment (green)

The proposed realignment to the rail spur and loop is located on land owned by BMA. Cut and fill techniques will be employed to achieve suitable rail gradients, under rail culverts for surface water drainage and occupational crossings for both stock and equipment movements.

Changes to the rail alignment will affect the length and area of alignment located outside the mine lease area. Train movements and frequencies will remain the same as described in the EIS.

Table 1 below quantifies the parameters of the proposed realignment.

Table 1 Length and area differences between EIS and Change Request rail alignments

Rail spur and loop	EIS / SEIS Rail Alignment	Post-EIS Rail Alignment	Difference
Total length (km)	17.08 km	12.50 km	- 4.58 km
Corridor width (m)	100.00 m	100.00 m	No difference
Length, outside Mine Lease (km)	6.35 km	11.65 km	+ 5.30 km
Length, inside Mine Lease (km)	10.74 km	0.08 km	- 10.66 km
Area, outside Mine Lease (ha)	62.38 ha	102.58 ha	+ 40.20 ha
Area, inside Mine Lease (ha)	93.01 ha	8.49 ha	- 84.52 ha
Area, total (ha)	155.39 ha	111.07 ha	- 44.32 ha

1.4 Scope of this assessment and advice

PB has been commissioned to prepare a Change Request to support changes to the CRM Project proposed by BMA. Amongst these changes is a change to alignment of rail infrastructure as described above. In terms of coal transportation, product coal will be railed to the Port of Hay Point (Hay Point Coal Terminal via existing Blair Athol Line) or to the Abbot Point Coal Terminal (via the Newlands and North Goonyella system upon completion of the Northern Missing Link Rail).

The purpose of the Change Request is to provide the Coordinator General with the necessary detail of the proposed changes to the CRM Project, associated environmental impacts and recommended mitigation measures to allow the Coordinator General to appropriately evaluate the proposed changes and provide an approval to BMA.

The area considered by this technical memo is limited to the length of the rail line from the point at which it deviates from the Blair Athol Mine Branch Railway to the point at which it crosses the boundary of ML70403.

Information sources which have been reviewed in preparation of this technical memo include the original EIS (including Appendices), the SEIS, the Co-ordinator General's Report and a partially completed draft Change Request prepared by URS. Additionally, URS has provided an email communication to PB (refer email communication from Dan Simmons (URS) to Pieter van der Linde (PB) dated 16/11/2010) which contains information about the general ecology of the rail alignment area. URS has advised that they

have an extensive knowledge of the vegetation values of the area in the field and are confident in characterising values from field knowledge and stereo photo interpretation.

It should be noted that PB has utilised the above mentioned information sources in preparation of this memo, together with additional desk-top research. No field studies were undertaken by PB within the amended rail alignment area to verify these information sources.

2. Assessment of proposed changes

2.1 Terrestrial ecology

2.1.1 Vegetation communities

In addition to review of Project specific information sources, an EPBC Act Protected Matters Report for the Post-EIS rail alignment area was generated for the purpose of this technical memo (search co-ordinates -22.12842, 148.0524; -22.06408, 147.9875; -22.07752, 147.9823; -22.14503, 148.0345). The results of this search are summarised in Table 2 below.

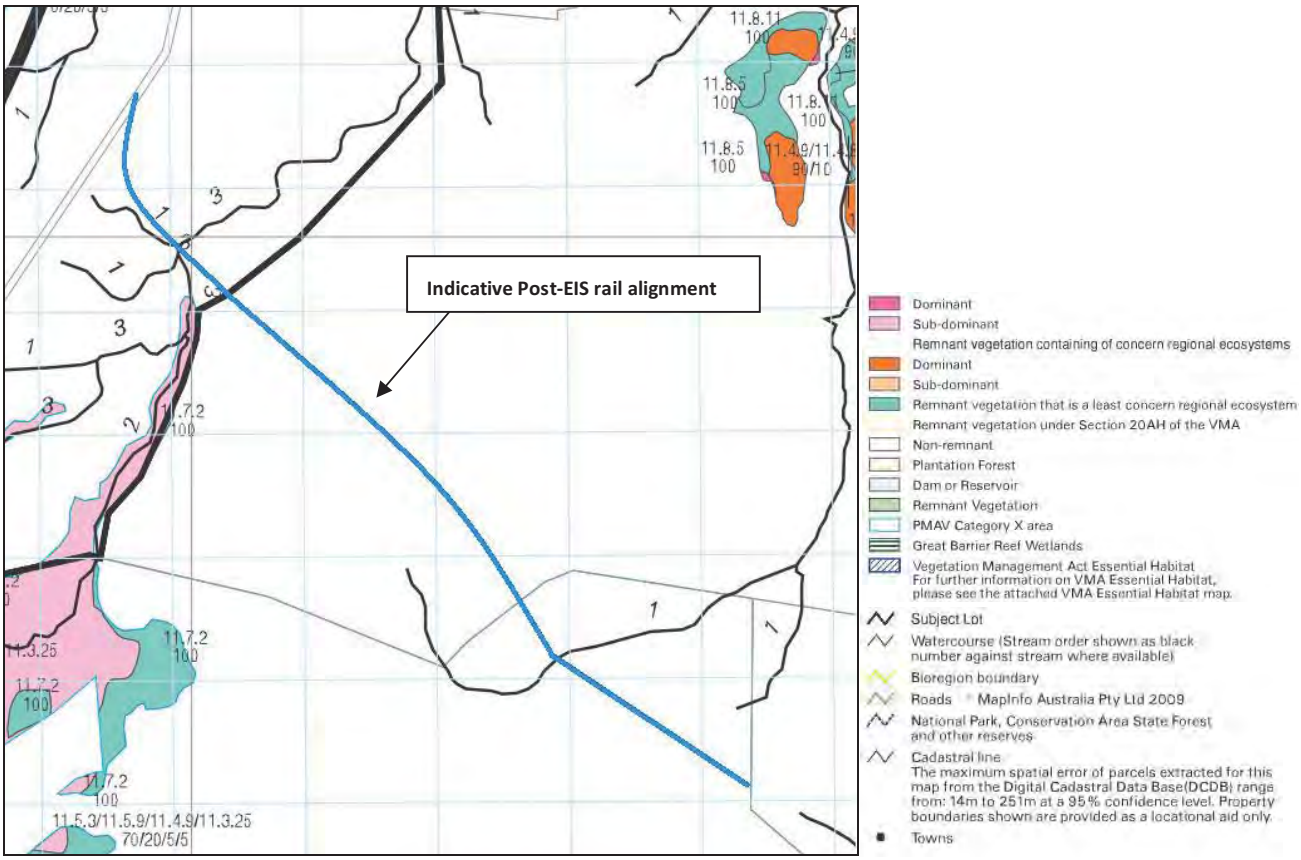
Table 2 EPBC Act Protected Matters Search Report Results (terrestrial flora only)

Matter of National Environmental Significance	Identified in the search area	Detail/comment
World Heritage Properties	None	--
National Heritage Places	None	--
Wetlands of International Significance (Ramsar sites)	1	Project site within same catchment as Shoalwater and Corio Bays Area
Commonwealth Marine Areas	None	--
Threatened Ecological Communities	2	Brigalow (*Acacia harpophylla* dominant and co-dominant) Endangered community may occur within search area Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin Endangered community may occur within search area
Threatened Species	9	Flora: Endangered *Cycas ophiolitica* (species or species habitat may occur within search area) Fauna: Endangered and Vulnerable bird, mammal and reptile species or species habitat may, or is likely to occur within the search area
Migratory Species	13	Migratory bird species or species habitat may, or is likely to occur in search area

These results indicate that Matters of National Environmental Significance protected under the EPBC Act have the potential to occur within the Post-EIS rail alignment.

URS has advised that air photo interpretation of the Post-EIS rail alignment has been undertaken and as a result, it has been concluded that vegetation communities within the alignment show limited potential for any conservation significant 'bluegrass' communities (i.e. communities analogous with Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin listed in Table 2 above) as there is no presence of black soils (Landzone 8) along the alignment. The vegetation communities present along the Post-EIS rail alignment (classified as non-remnant grassland and shrubby regrowth) is growing on more degraded soils of the same quality as identified and mapped within the EIS rail alignment.

Regional ecosystem mapping for the Post-EIS rail alignment was also requested from the Department of Environment and Resource Management (DERM) for preparation of this memo. Review of this mapping (refer Figure 1 below) indicates that the Post-EIS rail alignment does not cross or directly impact on any areas of mapped RE vegetation.



Source: DERM, 2010

Figure 1: Regional ecosystem mapping

Air photo interpretation undertaken by URS indicates that vegetation which exists along the mapped third order stream in the north-west portion of the alignment is likely to be non-remnant (likely Acacia sp. regrowth) and is also not likely to be high quality regrowth in accordance with definitions provided under the *Vegetation Management Act 1999*. Additionally, this regrowth vegetation would not constitute the Endangered Brigalow (*Acacia harpophylla* dominant and co-dominant) as identified in Table 2 above as the correct underlying landzone for this community is not present.

2.1.2 Threatened flora species

Results of the EPBC Act Protected Matters Search indicate that *Cycas ophiolitica* individuals or habitat may occur within the Post-EIS rail alignment area. This species is known to occur between Marlborough and Rockhampton in central-eastern Queensland and occurs on hill tops or steep slopes, at altitudes of 80-620m above sea level. It inhabits eucalypt open forest and woodland communities with a grassy understorey and grows on shallow, stony, red clay loams or sandy soils (Halford 1995).

Based on locality records and this preferred habitat description, this species is not expected to occur within the Post-EIS rail alignment area and therefore, the amended rail alignment is not expected to impact on any individuals of this species.

2.1.3 Fauna species and habitat

Two broad vegetation community types have been identified as occurring within the Post-EIS rail alignment area namely: Woodland and Open Forest and Grasslands. Fauna species of conservation significance are noted in the EIS as likely to occur in Woodland and Open Forest habitat areas (pp.8-51) and to a lesser extent (for occasional use by migratory bird species) in Grassland areas (pp 8-52). Therefore, as these vegetation communities occur within the Post-EIS rail alignment, then species of conservation significance may also occur by habitat association.

Therefore, the impact mechanisms (namely clearing, construction activities, Project operation) as identified in the EIS, will also apply to the Post-EIS rail alignment. Mitigation and compensatory measures as outlined in the EIS are deemed to be applicable to development and operation of the Post-EIS rail infrastructure.

2.1.4 Summary and comparison

A comparison and summary of expected impacts relevant to terrestrial ecology between the EIS and Post-EIS rail alignments is provided in Table 3 below.

Table 3 Comparison of terrestrial ecological impacts identified by the EIS and SEIS

Ecological consideration	Status in EIS	Status in SEIS	Post-EIS rail alignment
Mapped remnant vegetation	EIS rail alignment does not impact on any mapped remnant vegetation	As per EIS	Post-EIS rail alignment does not impact on any areas of mapped remnant vegetation
Mapped regrowth vegetation	Not assessed in EIS	N/A	Post-EIS rail alignment does not impact on any areas of mapped regrowth vegetation
Flora species of conservation significance (NC Act)	EIS rail alignment does not impact on any field identified flora species of conservation significance	As per EIS	Post-EIS rail alignment is not expected to impact on conservation significant flora individuals or habitat.

Ecological consideration	Status in EIS	Status in SEIS	Post-EIS rail alignment
Fauna species of conservation significance (NC Act)	No fauna species of conservation significance identified in EIS rail alignment	As per EIS	Fauna species of conservation significance may occur in the Post-EIS rail alignment area. Mitigation and compensatory measures as outlined in the EIS are deemed to be applicable to development and operation of the Post-EIS rail infrastructure.
Threatened ecological communities (EPBC Act)	EIS rail alignment does not impact on any field verified threatened ecological communities (EPBC Act)	As per EIS	Air photo interpretation indicates that EPBC Act threatened ecological communities are not likely to occur within the Post-EIS rail alignment area.
Threatened flora species (EPBC Act)	EIS rail alignment does not impact on any field identified threatened flora species (EPBC Act)	As per EIS	Post-EIS rail alignment is not expected to impact on *Cycas ophiolitica* individuals or habitat.
Threatened fauna species (EPBC Act)	No threatened fauna species identified in EIS rail alignment	As per EIS	Threatened fauna species may occur in the Post-EIS rail alignment area. Mitigation and compensatory measures as outlined in the EIS are deemed to be applicable to development and operation of the Post-EIS rail infrastructure.
Mapped Essential Habitat	Not assessed in EIS	N/A	Post-EIS rail alignment does not impact on any areas of mapped Essential Habitat
Declared pest plant species (LP Act)	Declared pest plant species were identified as occurring within the CRM project site	As per EIS	Declared pest plant species are expected to inhabit the Post-EIS rail alignment area. Management and mitigation strategies for this issue as detailed in the EIS are expected to be relevant for the subject rail alignment area.
Declared pest fauna species	Declared pest fauna species were identified as occurring within the CRM project site	As per EIS	Declared pest fauna species are expected to inhabit the Change Request rail alignment area. Management and mitigation strategies for this issue as detailed in the EIS are expected to be relevant for the subject rail alignment area

2.2 Aquatic ecology

Two drainage lines will be traversed by the Post-EIS rail alignment, namely a third order stream mapped in the north-west portion of the alignment and a first order stream mapped in the south-eastern portion of the alignment. The latter is an upper tributary to Horse Creek. The EIS states that all natural drainage lines occurring within the project site are ephemeral, as indicated by deep sandy stream beds and an

absence of aquatic (and often riparian) vegetation and this is expected to be the case for the drainage lines which will be traversed by the Post-EIS rail alignment.

Additionally, the EIS states that the results of previous surveys of the aquatic fauna within watercourses/drainage lines on the project site and adjacent Peak Downs mining lease indicate that at least six fish species persist within the local catchment, all of which are native, but none of which are listed under Commonwealth or State legislation, and all of which are considered to be common within the Fitzroy drainage system (WBM 1998, Ecoserve 2006). This is also expected to be the case for the drainage lines which will be traversed by the Post-EIS rail alignment.

Database searches undertaken for the purpose of this technical memo do not indicate the potential presence of any aquatic habitats, ecosystem or species of conservation significance as occurring within the Post-EIS rail alignment area.

The draft Environmental Management Plan contained in Appendix Q to the EIS and also Section 5.9.2.1 of the SEIS include management and mitigation measures relevant to protection of watercourses/drainage lines, water quality and aquatic habitats. These mitigation and management measures are also deemed applicable to development and operation of the Post-EIS rail alignment. Further, Section 5.9.2.3 of the SEIS states that construction of creek or gully crossings will provide for fish passage where deemed appropriate. This is also applicable to design and development of the Post-EIS rail alignment.

2.2.1 Summary and comparison

A comparison and summary of expected impacts relevant to aquatic ecology between the EIS and Post-EIS rail alignments is provided in Table 4 below.

Table 4 Comparison of aquatic ecology impacts identified by the EIS and SEIS

Ecological consideration	Status in EIS	Status in SEIS	Post-EIS rail alignment
Impact to aquatic habitat (e.g. drainage lines)	Potential impact of the EIS rail alignment on specific local drainage lines was not specified in the EIS	Construction of creek or gully crossings were mentioned in the SEIS (refer Section 5.9.2.3) and impact mitigation and management strategies outlined (Section 5.9.2.2)	Two mapped drainage lines will be traversed by the Post-EIS rail alignment. These drainage lines are expected to (1) be ephemeral in nature and (2) not to support any significant aquatic habitat. Mitigation and management measures listed in the EIS and SEIS are applicable to design, development and operation of the Post-EIS rail alignment.

Ecological consideration	Status in EIS	Status in SEIS	Post-EIS rail alignment
Aquatic fauna species of conservation significance (NC Act)	No aquatic fauna species of conservation significance identified in EIS rail alignment	As per EIS	No aquatic species of significance were identified through database searches. Significant impacts to aquatic fauna are not expected as a result of the Post-EIS rail alignment. Mitigation and management measures listed in the EIS and SEIS are applicable to design, development and operation of the Post-EIS rail alignment.
Threatened aquatic fauna species (EPBC Act)	No threatened aquatic fauna species identified in EIS rail alignment	As per EIS	As above
Aquatic flora species of conservation significance (NC Act)	EIS rail alignment does not impact on any field identified flora species of conservation significance	As per EIS	As above
Threatened flora species (EPBC Act)	EIS rail alignment does not impact on any field identified threatened flora species (EPBC Act)	As per EIS	As above

2.3 Sensitive environmental areas

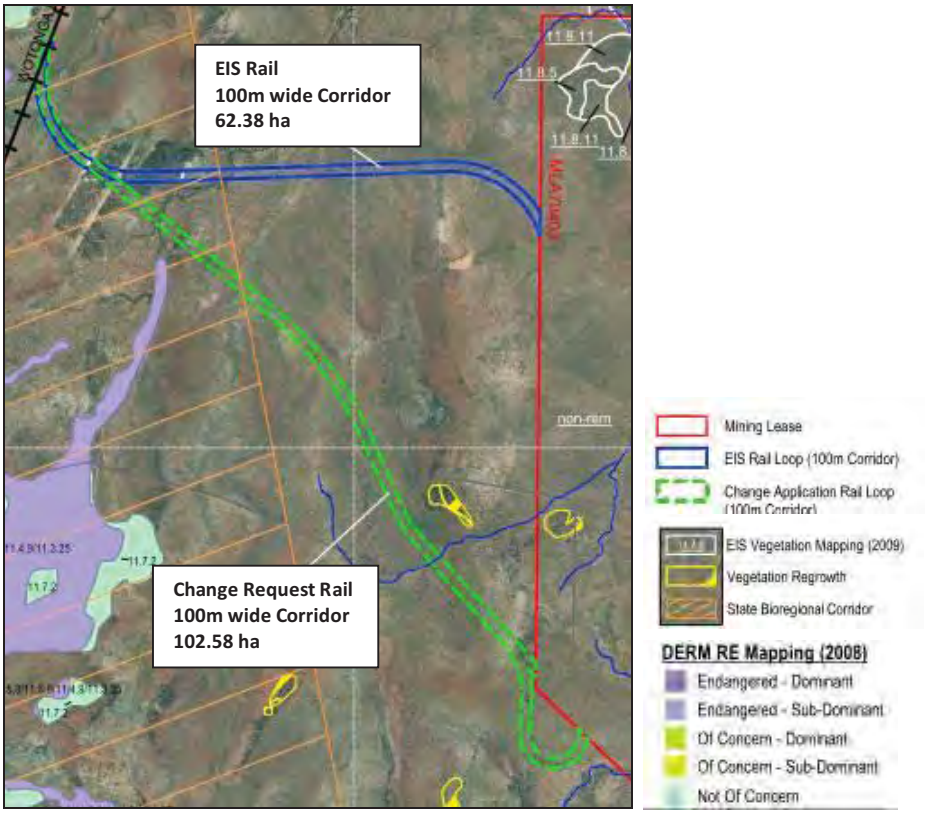
Consideration has been given as to whether the Post-EIS rail realignment impacts on any 'Sensitive Environmental Areas' which were detailed in the EIS. Table 5 provides a summary in this regard.

Table 5 EPBC Act Protected Matters Search Report Results (terrestrial flora only)

Sensitive Environmental Area	Detail/comment
Ramsar wetlands	Post-EIS rail alignment within same catchment as Shoalwater and Corio Bays Area
JAMBA	Migratory bird species or species habitat may, or is likely to occur in area
CAMBA	Migratory bird species or species habitat may, or is likely to occur in search area
Bonn Convention	Migratory bird species or species habitat may, or is likely to occur in search area
Protected estates	No protected estates are directly impacted by the Post-EIS rail alignment
National Parks	No National Parks are directly impacted by the Post-EIS rail alignment
Conservation Areas	No Conservation Areas are directly impacted by the Post-EIS rail

	alignment
Wilderness Areas	No Wilderness Areas are directly impacted by the Post-EIS rail alignment
Scientific Reserves	No Scientific Reserves are impacted by the Post-EIS rail alignment
Declared fish habitats	No Declared Fish Habitats are impacted by the Post-EIS rail alignment
Aquatic reserves	No Aquatic Reserves are impacted by the Post-EIS rail alignment
EPBC listed national significance matter	EPBC Act matters are detailed in previous sections of this memo. No significant impacts to Matters of National Environmental Significance are expected to result from the Post-EIS rail alignment

Reference to BPA mapping information for the Brigalow Belt North (2008) identified a State Bioregional Corridor passing across the north-west section of both the original and revised rail corridors (refer Figure 2). Therefore, development of the Post-EIS rail alignment will traverse part of a corridor of State biodiversity significance. The length (and hence area) of the rail alignment within this BPA mapped area is slightly greater under the Post-EIS rail alignment design than that under the EIS rail alignment design. Therefore, the Post-EIS rail alignment design represents potential for a slightly greater impact to State Bioregional Corridor values, however, the difference is not considered to be significant.



Source: URS, 2010

Figure 2: Mapped ecological considerations and rail line alignments

3. Summary of findings

Since completion of the EIS and SEIS for the Caval Ridge Mine, BMA have developed an alternative alignment for the rail spur and loop. The amended design diverts south-east from the Blair Athol Line to the rail loop and the TLO facility located within ML70403.

As a result of the realignment, the overall length of the rail line is reduced by 4.58 km (new total length being 12.5 km) and the area of disturbance associated with the rail loop is also reduced by 50 hectares (based on a 100m corridor width).

The Post-EIS rail alignment does not traverse any mapped remnant or high-value regrowth vegetation areas. A search of the EPBC Act Protected Matters database indicates that threatened ecological communities may occur within the broader rail alignment area however, air photo interpretation information provided by URS indicates that these vegetation communities are not likely to be present within the proposed rail alignment and therefore, no impact to these communities is expected to occur as a result of the rail realignment.

Flora and fauna species of conservation significance (at both the State and Commonwealth level) potentially utilise habitat and occur within the rail alignment area. Impact mechanisms (namely clearing, construction activities, Project operation) as identified in the EIS, will also apply to the Post-EIS rail alignment. Mitigation and compensatory measures as outlined in the EIS are deemed to be applicable to development and operation of the Post-EIS rail infrastructure.

Two mapped drainage lines will be traversed by the Post-EIS rail alignment. These drainage lines are expected to (1) be ephemeral in nature and (2) not to support any significant aquatic habitat. Mitigation and management measures listed in the EIS and SEIS are applicable to design, development and operation of the Post-EIS rail alignment.

4. Conclusion

4.1 Changes to environmental impacts

The Post-EIS rail alignment is not expected to result in environmental impacts which are significantly greater than or different to those detailed in the EIS for the EIS rail alignment.

4.2 Changes to future environmental approvals required for the Project

The Post-EIS rail alignment will not result in any changes to or need for additional environmental approvals.

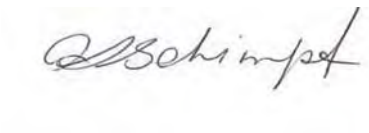
4.3 Change to mitigation measures required for the Project

No new mitigation or management measures are recommended as a result of the Post-EIS rail alignment. The management and mitigation measures detailed in the EIS (including the draft EMP) and SEIS are considered both applicable and sufficient to respond to design, development and operation of the Post-EIS rail alignment.

4.4 Change to Coordinator General's conditions and recommendations

The Post-EIS rail alignment is not expected to require any significant changes to the Co-ordinator General's conditions and recommendations.

Yours sincerely



Anjeanette Schimpf
Senior Environmental Scientist
Parsons Brinckerhoff Australia Pty Limited

Appendix G – Technical assessment addressing noise (Heggies, 2010)

13 August 2010

20-2028 URS Revised Rail Loop LR 20100813.doc

URS
Level 16, 240 Queens Street
Brisbane QLD 4000

Attention: Rob Storrs

Dear Rob

Caval Ridge Mine EIS
Noise Assessment
Revised Rail Loop

1 Introduction

BM Alliance Coal Operations Pty Ltd (hereafter, "the Proponent") proposes to develop the Caval Ridge Mine, a new coal mining operation near the town of Moranbah, Queensland.

Heggies Pty Ltd (hereafter, "Heggies") was commissioned by URS Australia to undertake a Construction and Operational Noise and Vibration Impact Assessment (hereafter, "assessment") of the proposed Caval Ridge Mine Project for inclusion in their Environmental Assessment. For the full assessment report, refer to Heggies report 20-2028-R2R3 dated 19 May 2009.

This report identifies the operational noise impacts associated with the revised rail loop proposed for the Caval Ridge Mine on the greater Moranbah community.

2 Revised Rail Loop Description

The revised rail loop is proposed to divert from the Goonyella System southwest of the Jilalan Rail Yard and track southeast to the proposed coal handling and preparation plant (CHPP) for the Caval Ridge Mine. The total track length is approximately 12.5 km (including the loop).

The previous rail loop diverted from the Goonyella System southwest of the Jilalan Rail Yard and tracked east to the Project site boundary and then south to the proposed CHPP for the Caval Ridge Mine. The total track length was approximately 17 km (including the loop).

HEGGIES PTY LTD
Part of the International SLR Group

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3 Methodology

The Nordic Rail Traffic Noise Prediction Method (Kilde 130) dates from 1984. Due to its ability to reliably deliver accurate predictions (within 2 dB(A) of measured), it has been commonly utilised in rail noise assessments across Queensland for over a decade. It calculates emission noise level based on the number of trains, speed, and length and predicts $L_{Aeq(24hour)}$ and pass-by maximum levels as required by the EPP (Noise).

Rail noise levels from the revised rail loop for the Caval Ridge Mine project have been predicted at all sensitive receptor locations (as shown on **Figure 1**). The parameters used to calculate the future rail noise levels were supplied by the Proponent and are summarised in **Table 1**.

Table 1 Train Movements for Caval Ridge Mine Project

Parameter	Value
Number of train movements per day (average)	2
Notch setting of train	Notch 1-2
Speed of train	2 - 20 km/h
Length of train	2 000 m
Number and type of locomotives	4 diesel (4000 class) from 2010 to 2012 and 3 diesel (3700 or 3800 class) from 2012 onwards

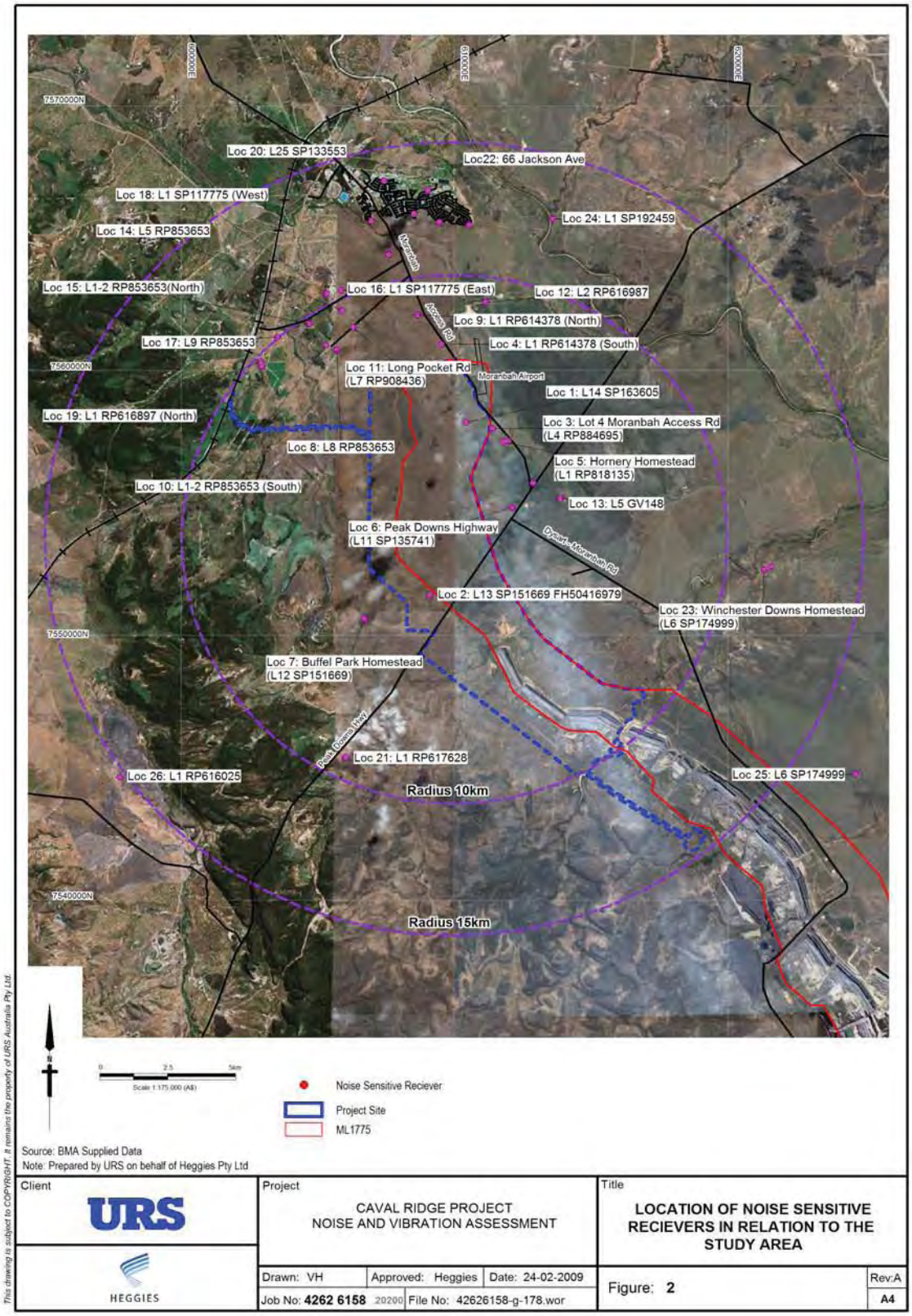
Rail noise emissions were represented by two noise sources:

- Diesel and electric locomotives.
- Freight consist.

Rail noise levels were predicted by reference to the general rolling stock emissions used by QR and conservatively the 4 diesel (4000 class) locomotives (as opposed to the three 3700 or 3800 class locomotives) were modelled.

The predicted rail noise levels from the revised rail loop for the Caval Ridge Mine project have been compared to the predicted noise levels from the operational noise scenarios as well as the previously predicted rail noise levels (refer to Section 9 of Heggies report 20-2028-R2R3 dated 19 May 2009).

Figure 1 Location of Noise Sensitive Receivers



4 Comparison of Results

The following section details the comparison of noise prediction results for the previous rail loop and the revised rail loop. Further, this comparison of results is based on the inclusion of the predicted rail noise levels in the operational mining modelling scenarios as described in Heggies report 20-2028-R2R3 (dated 19 May 2009). The results reference the two assessment noise criteria used for the EIS ($L_{Aeq(1hour)}$ operational criterion and L_{Amax} sleep disturbance criterion).

A comparison of predicted $L_{Aeq(1hour)}$ noise levels for the previous rail loop design and the revised rail lop design noted an increase of up to 1 dBA for one or more operational mining modelling scenarios at Location 7 (Buffel Park) and Location 19 (L1 RP616897 North). The predicted L_{Amax} noise levels (in comparison to those from the previous rail loop design) increased by up to 6 dBA for one or more operational mining modelling scenarios at the following sensitive receptors:

- Location 7 – Buffel Park.
- Location 13 – GV148.
- Location 19 – L1 RP616897 North.
- Location 20 – L25 SP133553.
- Location 23 – Winchester Downs.
- Location 25 – L6 SP174999.
- Location 26 – L1 RP616025.

It is noted that of the above mentioned sensitive receptors where increases in $L_{Aeq(1hour)}$ and L_{Amax} noise levels have been predicted, the maximum predicted exceedance of the relevant criteria has not increased above that reported in Heggies report 20-2028-R2R3 (dated 19 May 2009). The maximum predicted exceedance of the relevant noise criteria has not increased as the dominant noise source in each of the worst case operational mining modelling scenarios is from general mining operations (and not rail noise emission).

The only exception to this is Buffel Park where a 6 dBA increase in L_{Amax} is predicted for all operational mining modelling scenarios. With this increase, Buffel Park is now predicted to exceed the L_{Amax} criterion by 6 dBA for all operational mining modelling scenarios (Buffel Park previously had a maximum predicted noise level of 50 dBA L_{Amax} which complied with the L_{Amax} sleep disturbance criterion). However, it is noted that the predicted $L_{Aeq(1hour)}$ noise levels at Buffel Park exceed the $L_{Aeq(1hour)}$ operational criterion by up to 17 dBA (for both the previous rail loop design and the revised rail lop design). The 17 dBA exceedance of the $L_{Aeq(1hour)}$ operational criterion is a result of the noise contribution from general mining operations (and not rail noise emission). Further, BMA has advised that they have acquired this receptor through land resumption. Therefore, no additional noise mitigation measures would be required for this receptor.

For the remaining sensitive receptors which have not been predicted to increase in noise level (ie those not mentioned above), the $L_{Aeq(1hour)}$ noise level decreases by up to 4 dBA and the L_{Amax} noise level by up to 6 dBA in comparison to the previous rail loop design for one or more operational mining modelling scenarios.

Finally, a comparison of the predicted results noted that there were no overall changes to the maximum predicted exceedance of the relevant criteria with the inclusion of the revised rail loop. Further, the comparison of results between the previous and revised rail loop designs noted that those sensitive receptors which were previously predicted to comply with the relevant criteria remained in compliance and those sensitive receptors which were previously predicted to exceed the relevant criteria remained in exceedance of the noise criteria.

5 Recommendations

As discussed in **Section 4**, Buffel Park has been predicted to exceed the L_{Amax} noise criterion by 6 dBA for all operational mining modelling scenarios for both neutral and worst case meteorological conditions. However, it is noted that for both rail loop designs (the previously modelled rail loop design and the revised rail loop design) the predicted $L_{Aeq(1hour)}$ noise level at Buffel Park exceeds the $L_{Aeq(1hour)}$ operational criterion by up to 17 dBA. The 17 dBA exceedance of the $L_{Aeq(1hour)}$ operational criterion is a result of the noise contribution from general mining operations (and not rail noise emission). Further, BMA has advised that they have acquired this receptor through land resumption. Therefore, no additional noise mitigation measures would be required for this receptor.

No changes in the maximum predicted exceedance of the $L_{Aeq(1hour)}$ operational criterion or the L_{Amax} Sleep Disturbance criterion were predicted as a result of the revised rail loop design. Therefore, no additional noise mitigation measures (further to those documented in Section 10 of Heggies report 20-2028-R2R3 dated 19 May 2009) are required as a result of the revised rail loop design.

* * * * * * * * *

I trust that the above is sufficient for your present requirements. Please do not hesitate to contact me on (07) 3858 4800 if I can assist you further with this or any other matter regarding the Caval Ridge Mine Project.

Regards

Glyn Cowie

Appendix H – Technical assessment addressing Indigenous cultural heritage (Woora Consulting, 2010)

Woora Consulting

ABN: 83 113 624 918

8 Powells Road, Farleigh QLD 4741 Phone: (07)4959 8822 Fax: (07)4959 8387
Email: admin@woora.com.au

26 April 2010

Attention: Craig Bancroft

Senior Environmental Advisor

Caval Ridge Mine

Moranbah

Dear Craig

RE: Cultural Heritage Approval of Areas on Mine site

I refer to the following areas on the Caval Ridge Mine that were surveyed recently and described as***: Rail Option – Area G***

Further to the above, I would like to inform you of the results of the cultural heritage inspection carried out by members of our BaradaBarna Claim Group, as requested by yourself.

There were items of Cultural Heritage Significance identified by the members of the survey team located and most of these were relocated. However there are artefacts at the below locations that were not able to be identified due to the low visibility of the area and we recommend monitoring as per below (except for trees to be avoided):

287	601822	7558936	2 frags s's g's, polish 1, fine grained 13x11x3; 13x6x3;	W. end of rail loop, near rail fence, side of red slope.
288	601924	7558333	s's muller frag polish 1 6x5x1.5 2 br silc 3ry 6x6x1.5; 4x3x0.5 br quartzite flaked piece 4x3x3; pink / br silc 3ry;	Area 10x6m on east bank
289	602529	7557731	br silc 1ry, 2 v/b 11x9x1.5 pale silc 3ry 5x3x1 br silc 3ry 3.5x3x1;	Near laneway in lancewood.
290	602525	7557741	pale silc core 1 plat 12x10x6;	
291	602632	7557700	3 br 3ry 6.5x5x2; 6x5x2 h/b at end; 3x2.5x1;	in erosion, edge of lancewood
292	603324	7557680	br silc core 7x5x4.5; 1 platform 100% rotated; br silc SES broken 6x3x2 u/w 1 red silc 3ry 3x3x1;	
293	603368	7557700	pink / br silc 3ry 7x4.5x1.5; grey silc 3ry 3x3x0.5;	
294	603464	7557718	grove of old brigalow and native orange	Avoid

There may exist, subsurface Cultural material that was not readily identifiable during the initial survey. In the event of any Cultural material being found during disturbance, our Cultural coordinator should be contacted immediately

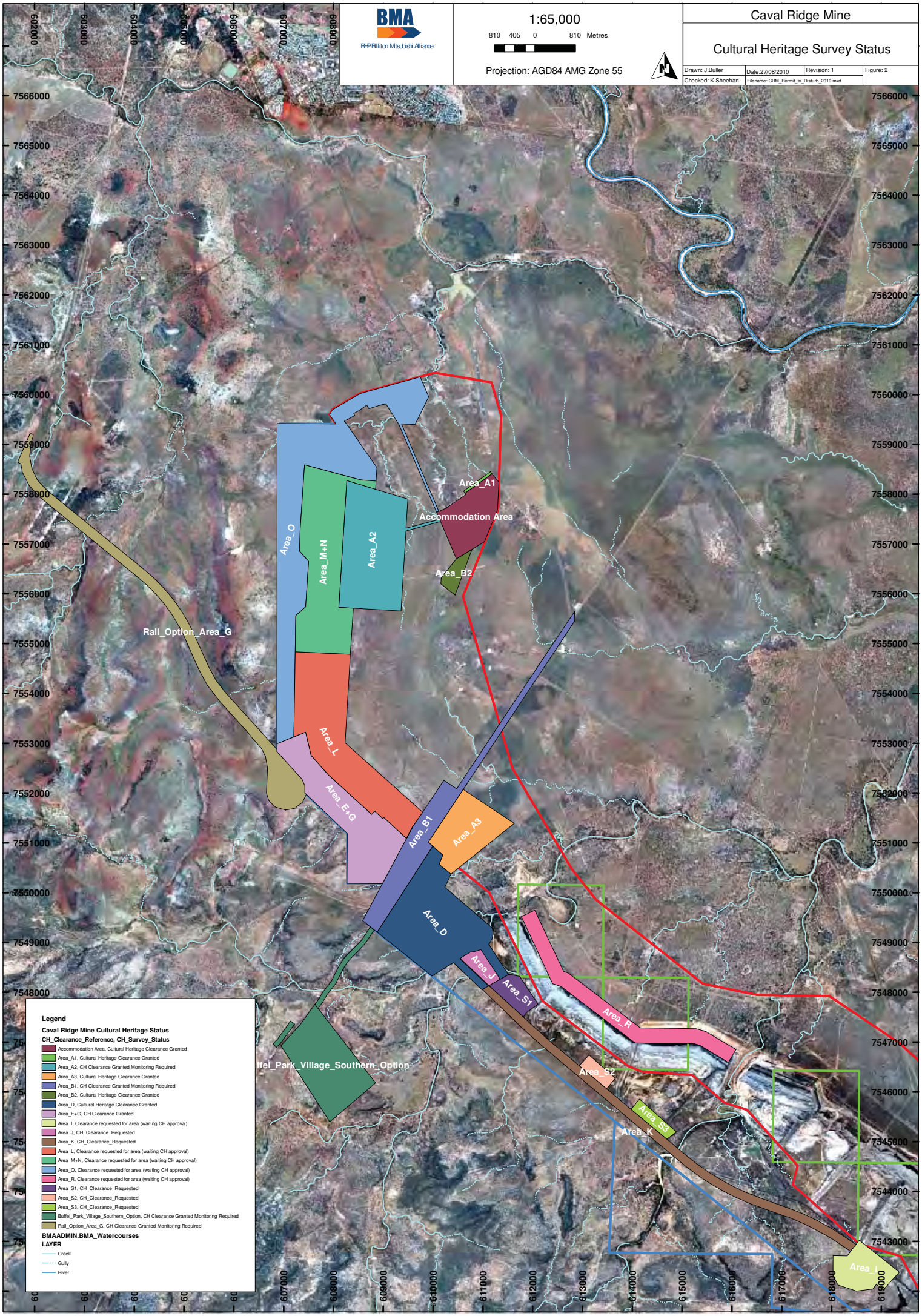
This letter is to serve as confirmation by us, that we give Cultural Heritage Approval of the area inspected with the above recommendation.

If you have any queries please do not hesitate to contact me on the above.

Yours Sincerely

Stacey Budby

Manager


BMA
BHPBilliton Mitsubishi Alliance
1:65,000
810 405 0 810 Metres
Projection: AGD84 AMG Zone 55
Caval Ridge Mine
Cultural Heritage Survey Status
Drawn: J.Buller
Checked: K.Sheehan
Date:27/08/2010
Filename: CRM_Permit_to_Disturb_2010.mxd
Revision: 1
Figure: 2
Area_A1
Accommodation Area
Area_B2
Area_A2
Area_M+N
Area_O
Area_L
Area_E+G
Area_B1
Area_A3
Area_D
Area_J
Area_S1
Area_R
Area_S2
Area_S3
Area_K
Area_I
Rail_Option_Area_G
Buffel_Park_Village_Southern_Option
Legend
Caval Ridge Mine Cultural Heritage Status
CH_Clearance_Reference, CH_Survey_Status
Accommodation Area, Cultural Heritage Clearance Granted
Area_A1, Cultural Heritage Clearance Granted
Area_A2, CH Clearance Granted Monitoring Required
Area_A3, Cultural Heritage Clearance Granted
Area_B1, CH Clearance Granted Monitoring Required
Area_B2, Cultural Heritage Clearance Granted
Area_D, Cultural Heritage Clearance Granted
Area_E+G, CH Clearance Granted
Area_I, Clearance requested for area (waiting CH approval)
Area_J, CH_Clearance_Requested
Area_K, CH_Clearance_Requested
Area_L, Clearance requested for area (waiting CH approval)
Area_M+N, Clearance requested for area (waiting CH approval)
Area_O, Clearance requested for area (waiting CH approval)
Area_R, Clearance requested for area (waiting CH approval)
Area_S1, CH_Clearance_Requested
Area_S2, CH_Clearance_Requested
Area_S3, CH_Clearance_Requested
Buffel_Park_Village_Southern_Option, CH Clearance Granted Monitoring Required
Rail_Option_Area_G, CH Clearance Granted Monitoring Required
BMAADMIN.BMA_Watercourses
LAYER
Creek
Gully
River

Appendix I – Technical assessment addressing Non-Indigenous Cultural Heritage (Converge, 2010)

Caval Ridge Rail Loop Review – 18 August 2010

Background

BMA are proposing to lodge a change application for the Project for the currently proposed rail spur, as outlined in an email from URS on 27/07/2010. Essentially the original rail loop assessed in the EIS will be moved further south (see figure 1622a – June 2010). The size of the rail loop increases from 61.5ha to 235ha in size.

Recommendation 3 (Section 7.3) of the non-Indigenous Cultural Heritage Survey Report of the proposed Caval Ridge Project (ARCHAEO 2009) discusses the expectation for BMA when a variation to the Project Design is proposed:

> ***Recommendation 3 – Variation to Project Design (***
> *This study has assessed the impact of the Project within the Study Area. Whilst unlikely, any variation to the Project which places mining or infrastructure outside the assessed area would require reassessment to determine the nature of the impact on sites and places of cultural heritage significance.*

For this reason, the following review is provided in respect to potential impacts resulting from the revised rail spur in relation to non-Indigenous cultural heritage.

Summary of Review

1. Cultural Heritage Survey Report

As abovementioned, ARCHAEO Cultural Heritage Services undertook a non-Indigenous cultural heritage survey to clarify the nature of cultural heritage significance relevant to the Caval Ridge Study Area in 2008 (revised 2009) for the EIS. This report also provided a discussion of potential impacts and required mitigation as a result of the proposed Caval Ridge Project.

The Study Area is located to the north of the existing BMA operation at Peak Downs, south of Moranbah. This previous assessment included:

- Historical background for the Study Area;
- Further contextual research as required from the abovementioned review;
- The results of the cultural heritage field survey;
- The nature of cultural heritage significance within the Study Area and the potential
- impacts of the project in relation to this significance; and
- Specific management recommendations for the protection of potential areas of cultural heritage significance.

The field survey covered approximately 50% of the overall Study Area via vehicular and pedestrian survey, including the previously proposed rail spur

area. The survey identified no sites of cultural heritage significance and five places of historical interest within the project site. It is important to note that HI places are those which contribute to the broader discussion of historic cultural heritage places, they do not, however, provide a suitable level of cultural heritage significance in their own right to justify further assessment or specific mitigation strategies.

It was also outlined that some potential for further historic items to exist within the project site. In particular, potential exists for surface and/or subsurface road remnants along the old telegraph line (HI – 1) where an old road potentially passed through. Elements associated with older roads and stock routes from times past may also exist in this area.
Other potential sites and places may include mile markers, survey trees, historic camp remnants and associated exotic vegetation, remote graves, old station dumps and remains of early mining activities.

From a cultural heritage perspective, it was concluded that the project site is likely to contain low levels of local cultural heritage significance. There were no sites or places located within the project site that contain levels of cultural significance important to Queensland under Section 35 of the *Queensland Heritage Act 1992*.

As there were no sites of cultural heritage significance found within the Caval Ridge Study Area by this assessment, a range of general mitigation measures was provided to manage potential impacts on non-Indigenous cultural heritage as a result of Project activities.

2. EM Plan

An EM Plan was also constructed for the Project in 2009. The EM Plan provides management strategies to mitigate impact and potential impact to unexpected cultural heritage material or sites found during the construction and pre-clearing activities during operations of the project. Management strategies within the EM Plan include initiatives which:

- Provide all new employees with suitable training to provide them with the skills to identify cultural heritage sites or objects and report the find to the Site Environmental Advisor;
- Inform all employees of their obligations to notify the, Site Environmental Advisor of any cultural heritage finds;
- Implement a procedure that requires a permit before any relevant employees able to undertake any clearing or excavations activities;
- Development a cultural heritage policies for management of existing cultural heritage sites or finds;
- Inform the Site Environmental Advisors of their obligations to notify the Environmental Protection Agency of any relevant finds; and
- Undertake regular cultural heritage educational sessions and distribute educational material. This material should inform the employees of what cultural heritage material may look like, and give them clear instructions on what to do if they find anything.

Findings of Review

The following conclusions are provided in relation to the reassessment of potential impacts on non-Indigenous cultural heritage as a result of the proposed variation to the rail loop for the Caval Ridge Project.

1. The Non-Indigenous Cultural Heritage Survey for the Caval Ridge Project (ARCHAEO 2009), provides suitable information to assess potential impacts on non-Indigenous cultural heritage for the proposed variation to the rail loop. No further research or field investigation is required following the above mentioned review in respect to this variation of the proposed rail loop.

2. The revision to the rail loop places no further impacts on known sites of non-Indigenous cultural heritage significance.

3. There remains for some potential for further historic items to exist within the revised project site. The results provided by the current Caval Ridge Cultural Heritage Survey Report (ARCHAEO 2009) provide sufficient conclusions and recommendations to managed potential NICH sites and values within the revised area.

4. The EM Plan prepared for the Project (2009) was also reviewed. This document provides sufficient procedures to manage non-Indigenous cultural heritage matters during the life of the Project, particularly in the event of an incidental find of potential non-Indigenous cultural heritage significance.