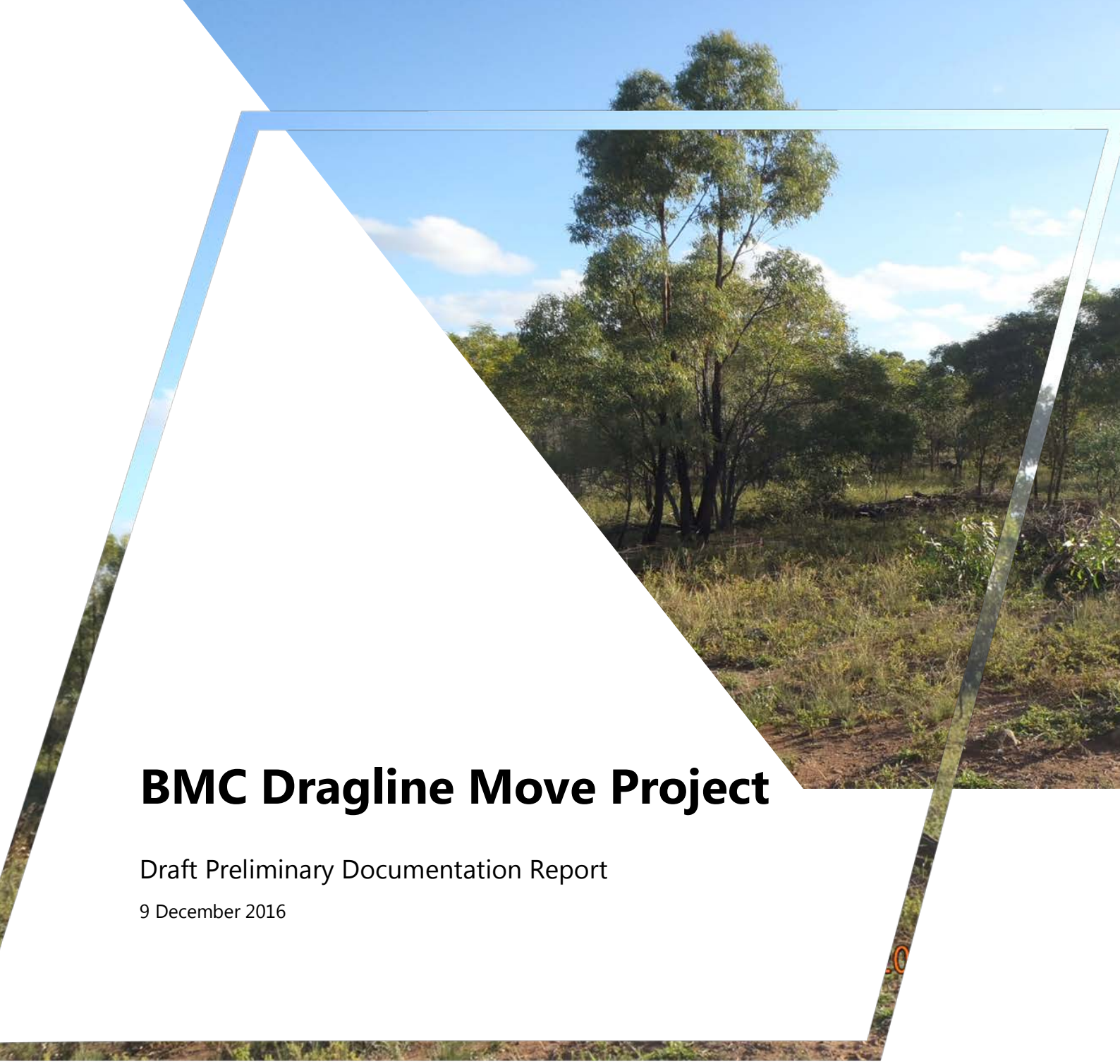

BMC Dragline Move Project

Draft Preliminary Documentation Report

9 December 2016

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Australia

301310-13545-EN-REP-0003

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Project No: 301310-13545-EN-REP-0003 – BMC Dragline Move Project: Draft Preliminary Documentation Report

Rev	Description	Date
0	Issued for lodgement	9 December 2016

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Acronyms and Abbreviations

Abbreviation/ Acronym	Description
ARI	Average Recurrence Interval
AS	Australian Standard
BMA	BHP Billiton Mitsubishi Alliance
BMC	BHP Billiton Mitsui Coal
CECP	Construction Environmental Control Plan
CQCN	Central Queensland Coal Network
DEHP	Queensland Department of Environment and Heritage Protection
DILGP	Queensland Department of Infrastructure Local Government and Planning
DoEE	Commonwealth Department of Environment and Energy
DRE27	Dragline 27
DTMR	Queensland Department of Transport and Main Roads
EMP	Environmental Management Plan
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
GBR	Great Barrier Reef
GRM	Goonyella Riverside Mine
ha	Hectare
kPa	Kilopascal
kV	Kilovolt
m	Metres
mm	Millimetres

Abbreviation/ Acronym	Description
m^3	Cubic metres
MNES	Matter(s) of National Environmental Significance
MSES	Matter(s) of State Environmental Significance
NC Act	*Nature Conservation Act 1992*
RPEQ	Registered Professional Engineer of Queensland
SARA	Queensland State Assessment and Referral Agency (DILGP)
SP Act	*Sustainable Planning Act 2009* (Qld)
SPMT	Self-Propelled Modular Transporter
SP Regulation	*Sustainable Planning Regulation 2009*
SWC	South Walker Creek Mine
SWER	Single Wire Earth Return
TEC	Threatened Ecological Community
%	Percent

1 Introduction

BHP Billiton Mitsui Coal (BMC) is proposing to move a dragline from Goonyella Riverside Mine (GRM) to South Walker Creek Mine (SWC) along a route approximately 77 kilometres (km) in length. The dragline is planned to be operational at SWC by 1 July 2017. The Project dragline move route is located near Moranbah, Nebo and Coppabella within the Isaac Regional Council Local Government Area of Queensland.

1.1 Project title

The Project is the BMC Dragline Move Project, referred to herein as "the Project".

1.2 The Proponent

The Proponent of the Project is BHP Billiton Mitsui Coal, referred to herein as "BMC".

1.3 Assessment process

1.3.1 Commonwealth assessment process

A referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was lodged for the Project with the Department of Environment and Energy (DoEE) on 10 October 2016 (referral number: 2016/7788). On 8 November 2016 the Project was determined to be a controlled action subject to the controlling provision of 'listed threatened species and communities' (EPBC Act sections 18 and 18A). DoEE also advised at this time that the assessment of the proposed action would be by Preliminary Documentation.

DoEE issued a request for additional information on 18 November 2016. The information requested for the assessment is detailed in Table 1.

1.3.2 State assessment process

A development application under the *Sustainable Planning Act 2009* (SP Act) has been lodged with the Isaac Regional Council for assessment.

State approvals required include:

- Approval for operational work under the SP Act, that is:
  - Excavation or filling
  - Clearing of native vegetation
  - Made assessable under a planning scheme, if any part of the land is within 25 metres (m) of a state-controlled road and the work involves extracting, excavating or filling more than 50 cubic metres (m^3)

  - Development impacting on State transport infrastructure identified in schedule 9 of the *Sustainable Planning Regulation 2009* (SP Regulation) that is for filling or excavation not associated with a Material Change of Use or Reconfiguration of a Lot and meets or exceeds the threshold of 10,000 tonnes for development in Local Government Area population 2
  - Extracting, excavating or filling more than $50m^3$, if the land is within 25m of a railway or future railway land
  - Filling or excavation, if any part of the premises is subject to an easement in favour of a distribution entity or transmission entity under the *Electricity Act 1994* and the work is located completely or partly in the easement; or the work is located completely or partly within 10m of a substation site.
- Permit to tamper with animal breeding places (approved species management program) under the *Nature Conservation (Wildlife Management) Regulation 2006*
- Protected Plants Clearing Permit under the *Nature Conservation (Wildlife Management) Regulation 2006*
- Quarry material sales permit under the *Forestry Act 1959*
- Road Corridor Permit and Traffic Control Permit under the *Transport Infrastructure Act 1994*.

1.4 Purpose of this report

This report is the Preliminary Documentation requested by DoEE to assist in the assessment of the impacts of the Project on Matters of National Environmental Significance (MNES), particularly listed threatened species and ecological communities. This Preliminary Documentation does not deal with matters of relevance to Queensland Government jurisdiction, except where the listed threatened species or ecological communities may also be protected by Queensland legislation.

The information requested by DoEE is detailed in Table 1-1 below. This table also provides a reference to where in this report each request has been addressed.

Table 1 – Information requested by DoEE and reference table

Information requested	Preliminary Documentation section
Quantification of impacts	
Provide a map which displays all new sections of the dragline track alignment, including any EPBC threatened ecological communities that occur at the new sections and any core or essential habitat for the following listed species: Ornamental Snake (*Denisonia maculata*), Yakka Skink (*Egernia rugosa*), Koala (*Phascolarctos cinereus* combined populations of Queensland, New South Wales	Section 4.1.1, Appendix H

Information requested	Preliminary Documentation section
and the Australian Capital Territory) and Squatter Pigeon (southern) *Geophaps scripta scripta*	
Indicate on the map where the width of clearance in any new section will exceed 40 metres (such as for stockpiling areas), and the proposed width of clearance in metres.	Section 4.1.1, Appendix H
Provide a description of the extent of vegetation clearances (in hectares) at new sections of the alignment and an assessment of the potential impacts on any EPBC listed threated species and ecological communities.	Section 4.1, Appendix H
Assessment of impacts on Koala (*Phascolarctos cinereus* - combined populations of Queensland, New South Wales and the Australian Capital Territory)	
Explain (with supporting literature) the impact that the removal of 98 hectares (ha) of core and essential Koala habitat will have on local Koala population(s).	Appendix C
Explain (with supporting literature) the impact, if any, that the cleared track constructed for the dragline move will have on fragmenting Koala population(s).	Appendix C
Provide a map which displays the extent of the Koala habitat that exists within the broader area of Map 5.4a, 5.4b, 5.4c, 5.4d, 5.4e, 5.4f (2016-7788 Referral Attachment 3 Terrestrial Ecological MNES Assessment Appendices).	Appendix C
Avoidance and mitigation	
Provide the latest versions of any Environmental Management Plans (EMPs) that are proposed to mitigate impacts to the Ornamental Snake (*D. maculata*), Yakka Skink (*E. rugosa*), and Brigalow (*A. harpophylla* dominant and co-dominant) ecological community through ongoing management and associated monitoring of the	Section 5

Information requested	Preliminary Documentation section
proposed action. EMPs proposed for this action should include clear, measureable, time specific outcomes and performance criteria for mitigating impacts on the about listed species and communities, a monitoring regime that will track and record performance criteria and/or outcomes are not being met, and provisions for independent auditing (a guide to EMPs is available on the Department's website) at http://www.environment.gov.au/epbc/publications/environmental-management-plan-guidelines)	
Provide the latest versions of any Vegetation Clearing Procedure, Species Management Program and Rehabilitation Plan compiled for the dragline move project.	Vegetation Clearing Procedure: Appendix I Rehabilitation Management Plan: Appendix D Species Management Program: management measures contained in section 5.2.9 represent the BMC proposed Species Management Program.
Proposed offsets	
Propose a direct offset for impacts to the Ornamental Snake (*D. maculata*), Yakka Skink (*E. rugosa*) and Brigalow (*A. harpophylla* dominant and co-dominant) ecological community that compensates for at least 90 per cent of the impact, as determined by the Minister/Department in accordance with the EPBC Act offsets policy. The identified offset must clearly state whether the conservation gain is proposed to be achieved by: ▪ Improving existing habitat for the protected matter; ▪ Creating new habitat for the protected matter; ▪ Reducing threats to the protected matter; and/or	Appendix F; Appendix G

Information requested	Preliminary Documentation section
▪ Averting the loss of a protected matter or its habitat that is under threat.	
Provide detailed and evidenced based costings for the direct offset if it does not compensate for 100 per cent of the impact. This information is necessary to calculate the cost of the other compensatory measures component of the offset.	N/A
Identify the proposed offset's geographical location (including an appropriately scaled and geo-referenced map).	Appendix F
Detail the time-specific outcomes (Key Performance Indicators) against which achievement of the proposed offset outcomes will be measured. This includes interim milestones so the proponent can demonstrate they are on track to achieving the proposed offset outcomes. Please include a monitoring and evaluation plan that will be used to demonstrate that the offset is meeting the interim milestones and final outcomes.	Appendix F
Detail the management actions for the proposed offset, describing how the outcomes will be achieved, trigger values for corrective actions and the nature of corrective actions to be implemented if trigger values are reached;	Appendix G
Contain a table detailing the proposed offset's 'score' for each attribute of the Offsets assessment guide, an evidence-based justification for the score for each attribute, and literature references to support the evidence-based justification. If the offset involves improving habitat quality, the same methodology for measuring habitat quality must be used at both the impact and offset sites; and	Appendix F
Provide information on current land tenure of the proposed offset site and method of legally securing the offset.	Appendix F
Economic and social matters	

Information requested	Preliminary Documentation section
Details on the cost and/or benefit of the proposed action in comparison with other options (such as dismantling and reassembling the dragline).	Section 7.1
Potential employment opportunities expected to be generated during development and operation of the proposed action.	Section 7.2
Whether economic benefits and employment opportunities are in addition to what would have been expected if the action were not to take place.	Section 7.2
Details of any public stakeholder consultation activities, including the outcomes.	Section 7.3
Ecologically Sustainable Development	
Please provide a description of the proposed action in relation the principles of ecologically sustainable development, as defined in section 3A of the EPBC Act.	Section 8

2 Description of the Action

The Project dragline move route generally follows the same route used to move a similar dragline from GRM to SWC in 2000. However, it has changed in certain locations due to changes in land use since 2000. It is estimated that approximately 70 percent (%) of the route follows the same path as the 2000 dragline move. The Project will construct a temporary unsealed pathway, typically 40m wide, transport the dragline on a specialised transporter, and rehabilitate disturbed areas. The Project dragline move route has a total length of 77 km. The section of alignment located outside mining leases is approximately 70 km in length.

The required corridor width will be greater than the minimum 40m in some sections of the alignment due to ground conditions (i.e. for stockpiling of stripped topsoil). In vegetated areas, the required corridor width will in some cases be 60m or 80m to allow for vehicular traffic past the dragline and cleared vegetation stockpiling on the edges of the dragline pathway. Further details are provided in section 2.4.2.

A dragline is a large excavator used in the mining sector with a bucket pulled in by a wired cable. The dragline to be moved is known as dragline 27 (DRE27). DRE27 is a Marion 8050 dragline weighing approximately 3500t. It has a boom length of 99m and width of 28m. The dragline will be travelling with the boom up and the bucket removed. It will be approximately 68m high with an additional 5m for the transporter.

BMC proposes to:

- Following the end of DRE27 operations at GRM, commission maintenance activities on the machine prior to the proposed move (these activities represent already approved mining activities)
- Move the dragline along a temporary pathway, established by clearing vegetation, placing fill and completing civil work activities in areas within the proposed dragline move corridor where ground conditions are inadequate to enable the dragline to advance
- Rehabilitate the dragline move corridor
- Commission and operate the dragline at SWC as part of already approved mining activities.

2.1 Project alternatives

BMC considered alternative routes for the dragline move. A key constraint to the move is steep gradients. The dragline is unable to move across terrain that exceeds approximately 10% gradient. The Carborough Range extends north-south in between GRM and SWC. BMC therefore considered routes to the north and further south of the Carborough Range. These routes were ruled out for the following reasons:

- All routes required more extensive vegetation clearing - the selected route capitalises on using the 2000 dragline move path, which was cleared of vegetation at the time
- All alternative routes are longer, and therefore more costly

- The alternative routes offer no significant advantage in reducing the number of infrastructure crossings or interactions.

The selected dragline move route is shown in Figure 1.

2.2 Dragline move route alignment

The proposed route alignment and intersected properties are illustrated in Figure 1. Properties intersected by the dragline move route are detailed in Table 2.

BMC Dragline Move Project

Project Locality

- Dragline move corridor
- Existing roads
- Queensland Rail network
- Private rail network
- Cadastral boundaries
- Intersected properties
- Mining tenements

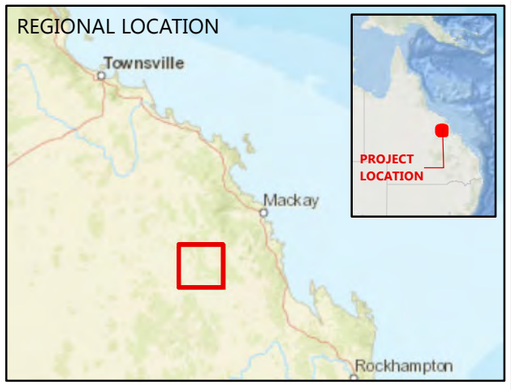
Source Information:
Dragline move disturbance corridor - Rev D
Supplied by BMA 03/11/2016
Rail network - Queensland, Physical Road Network - Queensland, Watercourses
Queensland Department of Natural Resources and Mines
Cadastral boundaries, ownership details, BMA tenements
Supplied by BMA/Hatch 19/07/2016

Coordinate System: GCS GDA 1994
Datum: GDA 1994
Scale at A3 - 1:225,000

N

0 2.5 5 7.5 10
Kilometres

REGIONAL LOCATION



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Rev: B 10/11/2016 ISSUED FOR INFORMATION Org: KM Chk: SL

Tenure details for the lots intersected by the dragline move route are provided in Table 2. Refer also to Figure 1 to view the location of each lot.

Table 2 Intersected properties

Lot on Plan numbers	Tenure	Land owner / holder
1 SP158697	Freehold	Coppabella Coal and Others
1 SP251730	Freehold	W.R. & E.J. Neilson
10 SP235299	Freehold	BHP Coal and Others
13 SP178466	Freehold	Wotonga Pastoral Pty Ltd
18 SP208194	Lands Lease	A.G.H. Williams
18 SP262679	Freehold	Vale Australia Pty Ltd
2 SP214498	Freehold	D.J. and J.E. Deguara
20 SP235298	Lands Lease	BHP Coal and Others
21 SP130064	Lands Lease	Queensland Rail
24 SP221564	Lands Lease	Queensland Rail
25 SP130068	Lands Lease	Queensland Rail
4 SP144274	Lands Lease	J.J. Borg
4 SP252740	Freehold	Vale Australia Pty Ltd

Lot on Plan numbers	Tenure	Land owner / holder
5270 SP144274	Lands Lease	E.M. and R.F. Bella and Others
7 SP155252	Freehold	BMC
8 SP155252	Freehold	BMC

2.3 Dragline pathway design

2.3.1 Dragline pathway

Two types of transporters are being considered, namely a tracked crawler and a Self-Propelled Modular Transporter (SPMT).

Figure 2 and Figure 3 illustrate both types of transporter and Table 3 provides specifications for each type. With regard to footprint, the SPMT requires smaller corridor and pavement widths. Final selection of the transporter will be based on multiple engineering and cost factors, including costs related to land clearing and earthworks.

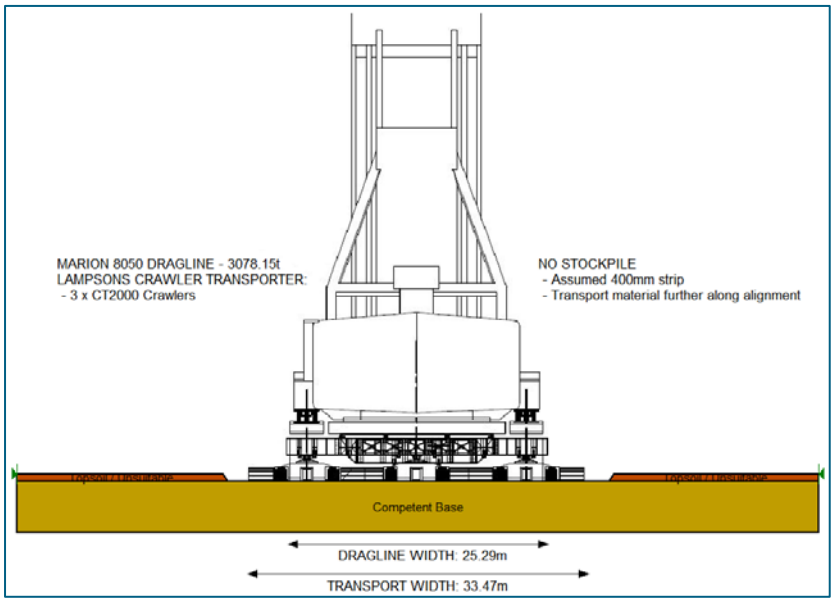

Figure 2 Tracked crawler arrangement

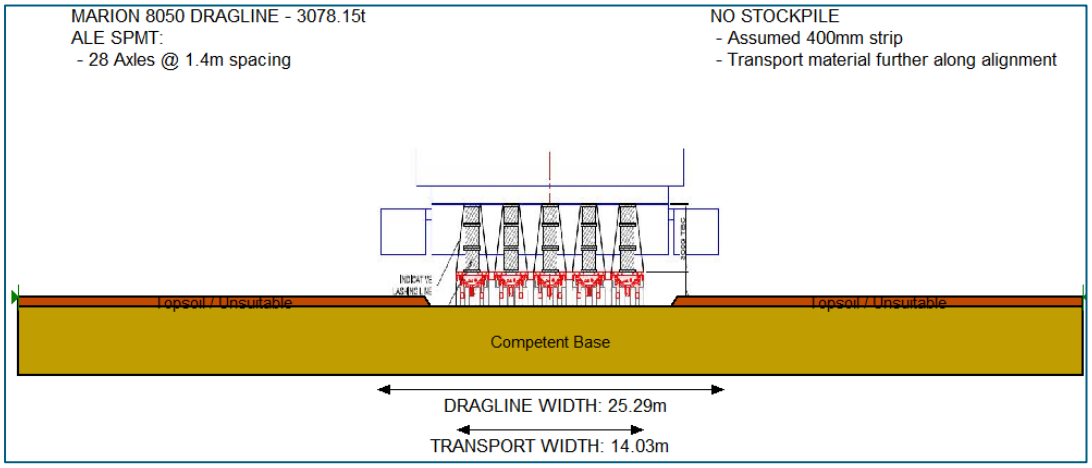

Figure 3 SPMT arrangement

Table 3 Tracked crawler and SPMT specifications

Specification	Tracked crawler	SPMT
Standard width for pavement preparation (wider for sharp turns)	40m	20m
Standard width for clearing	40m	26m
Minimum horizontal curve radius	150m	150m
Minimum vertical curve radius	250m	500m
Maximum longitudinal grade	10%	10%
Maximum cross-fall	2%	3%
Travel path minimum bearing capacity	250 kilopascals (kPa)	110kPa
Embankment slopes	1V:3H in fill 1V:3H in cut	1V:3H in fill 1V:3H in cut

For the purpose of this application, the worst case scenario of a tracked crawler has been used with regard to impact footprint, with the understanding that impacts associated with the use of a SPMT would be smaller.

Design drawing H351924-00000-223-273-1001 attached at Appendix A provides a typical design of the dragline pathway formation.

2.3.2 Watercourses crossings

The proposed alignment crosses a number of watercourses and drainage lines as detailed below:

- Named watercourses:
  - Isaac River
  - Skeleton Gully
  - Teviot Brook
  - North Creek
  - Thirty Mile Creek
  - Humbug Gully
  - Sandy Creek
- Unnamed tributaries, many of them drainage lines, to the following watercourses:
  - Isaac River
  - Skeleton Gully
  - Teviot Brook
  - Hat Creek
  - Smoky Creek
  - North Creek
  - Harrybrandt Creek
  - Bee Creek
  - Humbug Gully

The four watercourses with a stream order of 4 or above are the Isaac River (stream order 5), Teviot Brook (stream order 4), North Creek (stream order 4) and Harrybrandt Creek (Stream order 5).

The dragline will only cross watercourses when there is no flowing water in the relevant part of the watercourse. Construction of the watercourse crossings will be started as late as possible, remain in place for the minimum time required for the dragline to cross, be removed and the watercourses rehabilitated as soon as possible after the crossing event. This will be carried out in accordance with self-assessments applicable to temporary waterway barrier works and riverine works. However, the proponent is considering an option involving keeping the Isaac River crossing in place for a longer period, approximately three months (January to March). Should this be the case, larger culverts and upstream erosion protection would be installed.

To support the dragline and achieve the required vertical geometry, the watercourses will be temporarily filled with select fill sourced from a local borrow to provide a crossing point. The cutting of banks will be avoided for all crossings except the Isaac River and Teviot Brook crossings, where bank cuttings are required to achieve feasible designs. Low flow pipes will be installed to convey any unexpected incidental water flow during transportation. Should it be decided to maintain the Isaac River Crossing for a period of three months, larger culverts would be used and upstream crossing embankment protection would be included as part of the design.

Sediment fencing will be installed downstream of any crossing to trap sediment should a rainfall event occur while a crossing is in place.

Select fill will be sourced from local borrows in pre-defined regions in close proximity to each crossing that have been approved for use from a cultural, environmental and geotechnical perspective. The haulage distance will be less than 1 km at each location.

Post crossing, material will be removed and returned to the borrow area. The borrow area will be locally shaped to maintain existing drainage lines. The upper layer will be tyned with a grader prior to seeding.

Drawing H351924-00000-223-273-1002 attached at Appendix B provides a typical section of a watercourse crossing and the Isaac River crossing for the tracked crawler option. The design would be identical should a SPMT be used.

2.3.3 Road crossings

2.3.3.1 Location

The proposed dragline move route intersects the following roads:

- Goonyella Mine Access Road (chainage 0.1 km, unsealed)
- Red Hill Road (chainage 0.6 km, unsealed)
- Peak Downs Highway (chainage 43.7 km, sealed)
- Moorvale Mine Access Road (chainage 48.4 km, sealed)
- Peak Downs Highway (chainage 68.2 km, sealed).

With regard to Peak Downs Highway crossings, two crossing designs are considered depending on the use of a tracked crawler or a SPMT.

A temporary diversion road will be installed to accommodate traffic flow around the dragline as it traverses the dragline pathway.

The temporary road will be unsealed and be completed at intersections between the Peak Downs Highway and the dragline move route. The design criteria are summarised below:

- Operating speed: 40 km/h

- Design traffic: 2000 Vehicle / day
- Design life: 1 week.

Pavement material will comply with the Queensland Department of Transport and Main Roads (DTMR) *Technical Specification - Transport and Main Roads Specifications - MRTS05 Unbound Pavements*.

Pavement layer material will be placed in continuous, approximately horizontal layers having a compacted thickness of not more than 200 millimetres (mm). Each pavement layer will be compacted with a smooth drum roller or other equipment determined appropriate by compaction trials. Road pavement and geometry will be determined in accordance with the ARRB Unsealed Roads Manual.

Temporary signage will be installed in accordance with the Manual of Uniform Traffic Control Devices.

2.3.3.2 Road closure works

Tracked crawler option

The following sequence of activities will be followed during the road closure phase.

1. A day before the proposed road closure, the diversion road pavement will be tied into the main road. This work will be completed under suitable traffic management controls.
2. Diversion road opened, main road closed.
3. Pavement protection layer and tie-in to ramp completed.
4. Steel beams lifted into place.
5. Crossing completed.
6. Protective layer removed, including shoulder material.
7. Steel beams removed.
8. Main road reopened under traffic management.
9. Diversion road tie-in removed under traffic management.
10. Concrete blocks removed under traffic management.

SPMT option

The following sequence of activities will be followed for the road crossings.

1. A day before the proposed road closure, the diversion road pavement will be tied into the main road. This work will be completed under suitable traffic management controls.
2. Diversion road opened, main road closed.
3. Pavement protection layer and tie-in to ramp completed.
4. Crossing completed.
5. Protective layer removed, including shoulder material.
6. Main road reopened.
7. Diversion road tie-in removed under traffic management.

2.3.3.3 Earthworks volume estimates

Preliminary earthwork estimates for the two Peak Down Highway Crossings are provided in Table 4. Indicative cut and fill areas are provided in Figure 4 and Figure 5. This information is based on the tracked crawler option, which is a worst case scenario with regard to earthwork quantities.

Table 4 Peak Downs Highway crossings earthworks volumes

Crossing Reference	Alignment Chainage (km)	Earthworks (m^3)	
		Cut	Fill
Peak Downs Highway 1	43.7	2,730	2,840
Peak Downs Highway 2	68.2	450	3,930

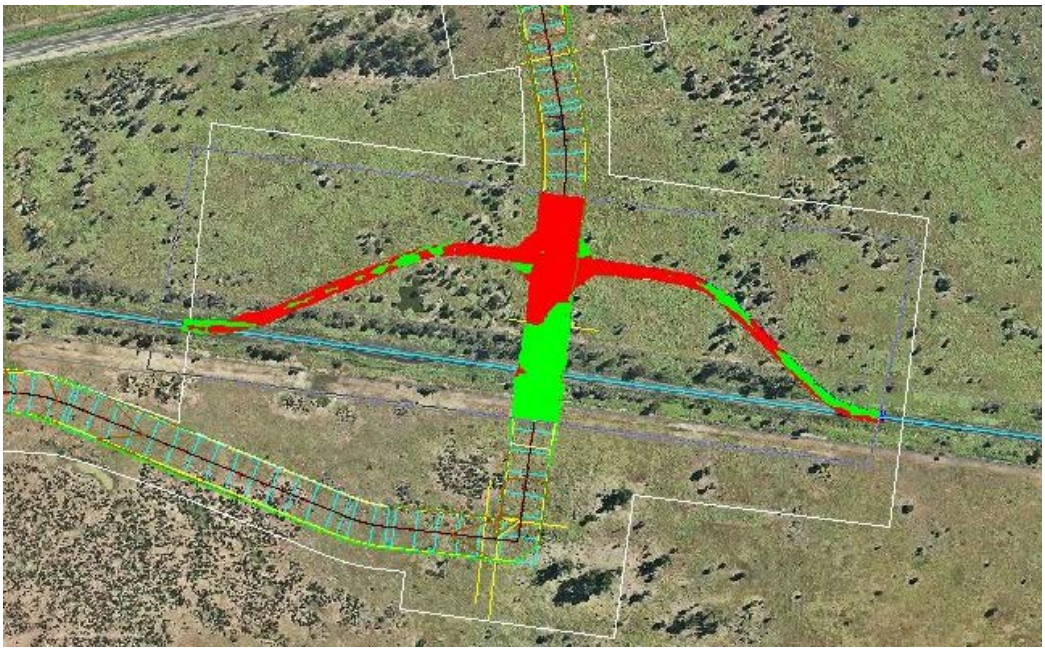

Figure 4 Peak Downs Highway (Alignment CH43.7)
(Red: cut areas; Green: fill areas)

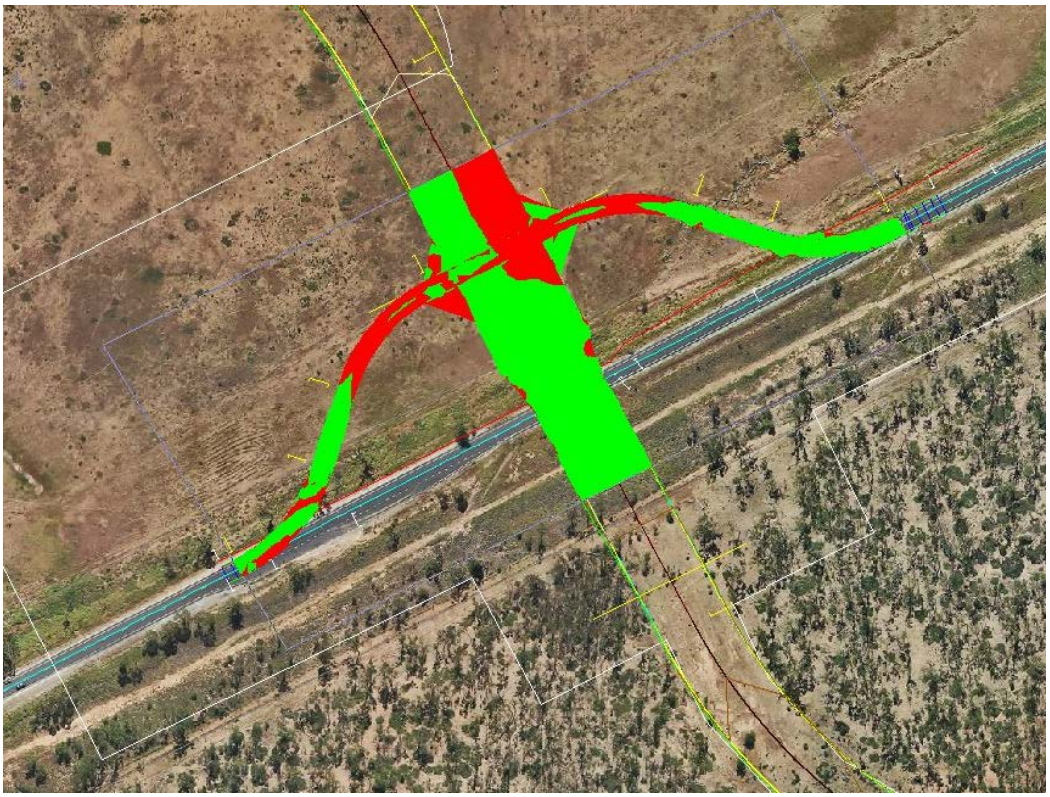

Figure 5 Peak Downs Highway (Alignment CH68.2)

(Red: cut areas; Green: fill areas)

2.3.3.4 Drainage and erosion control

As the works associated with the dragline move are temporary and scheduled to take place during the dry season, a 1 year ARI design event has been adopted for all stormwater infrastructure associated with the road crossings. Conveyance of stormwater at each crossing will be maintained through the installation of culverts at the locations where the temporary works are identified to obstruct the existing roadside drainage. Culvert sizing is summarised in Table 5.

Table 5 Culvert sizing

Catchment	Minimum required cover for no overtopping	Culvert size	
		Number of pipes	Minimum Internal Diameter
Crossing 1B	350mm	3	150mm
Crossing 1C	200mm	3	150mm
Crossing 1D	200mm	2	150mm
Crossing 2A	0mm	2	150mm
Crossing 2B	0mm	2	150mm
Crossing 2C	300mm	2	300mm

Additionally, stormwater runoff from upstream catchments will be directed around the road diversions with the assistance of adjacent berms. The risk of the temporary works increasing scour and deposition of sediment in areas downstream of each road crossing will be managed through the selective use of silt fences and check dams.

2.3.3.5 Traffic management

Traffic management will be implemented at each crossing in accordance with the design and under an approved Traffic Management Plan. The Traffic Management Plan is proposed to be prepared as part of the application for a Road Corridor Permit and Traffic Control Permit to DTMR.

2.3.4 Railway crossings

2.3.4.1 Location

The proposed alignment intersects Aurizon-owned railways in three locations as detailed in Table 6.

Table 6 Railway crossings

Rail crossing	Railway chainage	Alignment Chainage	Crossing type
Goonyella Branch	154.24 km	40.5 km	Electrified dual Track
Norwich Park Branch	6.20 km	47.4 km	Electrified dual Track
Goonyella Branch	129.12 km	68.6 km	Electrified dual Track

To provide passage for the dragline transporter, a select fill ramp will be placed adjacent to the formation and higher than the formation level. Following removal of the electrification wires, steel beams will be placed over the formation to the level of the ramps. Steel plates will be placed over the beams to form a trafficable platform over the ballast and rails.

2.3.4.2 Potential timing of works

All work associated with the crossing and the actual passage of the dragline over the crossing will occur within pre-approved Aurizon scheduled outages as detailed in the draft Central Queensland Coal Network (CQCN) 2017 Maintenance Outage Calendar. The below potential closure dates have been identified for the Goonyella System:

- April 19th – 20th (36 hours – 06:00 to 18:00)
- May 23rd – 25th (36 hours – 06:00 to TBC)
- July 11th – 12th (36 hours – 06:00 to 18:00)
- August 8th – 9th (36 hours – 06:00 to 18:00)
- September 13th (<36 hours; however possible negotiation)

2.3.4.3 Design overview

The crossing design involves using a series of steel beams and plates seated on abutments either side of the crossing and on a central support, and bridging the dual rail crossing.

Specific construction zones exist around the rail corridor, which dictate where works can only be completed during outages. These zones are defined below:

- Danger zone: 3m either side of the rail outer edge - work to be completed during outages
- Rail easement / corridor - works to be completed by approved contractors outside of scheduled outages.

Based on these requirements, the scope of works can be separated into pre-works, which are completed outside the outage, and shutdown works, completed during the main outage.

This methodology eliminates contact with the rail, reducing the risk of damage to the rail or formation, and allows all earthworks to be completed outside of the danger zone as pre-work.

Construction loads

As no earthworks will be completed inside the danger zone and all services will be identified and adequately protected, any construction loads generated, including vertical and horizontal loading, will have no impact on the integrity of rail infrastructure.

2.3.4.4 Earthwork volume estimates

Preliminary earthwork estimates for the crossings are provided in Table 7. Indicative cut and fill areas are provided in Figure 6, Figure 7 and Figure 8.

Table 7 Rail Crossings – Earthwork Volumes

Crossing Reference	Railway Chainage (km)	Alignment Chainage (km)	Earthworks (m^3)	
			Cut	Fill
Crossing 1 -Goonyella Line	154.24	40.5	2,254	4,370
Crossing 2 - Norwich Park Line	6.29	47.4	4,600	1,110
Crossing 3 - Goonyella Line	130	68.5	1,860	2,920

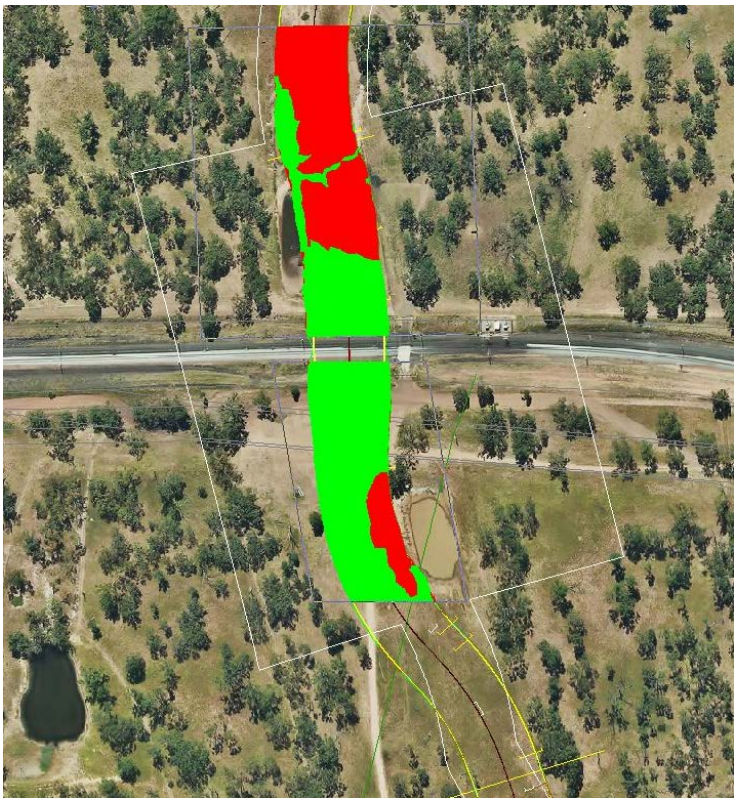

Figure 6 Crossing 1 - Goonyella Line (Rail CH154.24 / Alignment CH40.5)
(Red: cut areas; Green: fill areas)

Figure 7 Crossing 2 - Norwich Park Line (Rail CH6.29 / Alignment CH47.4)
(Red: cut areas; Green: fill areas)

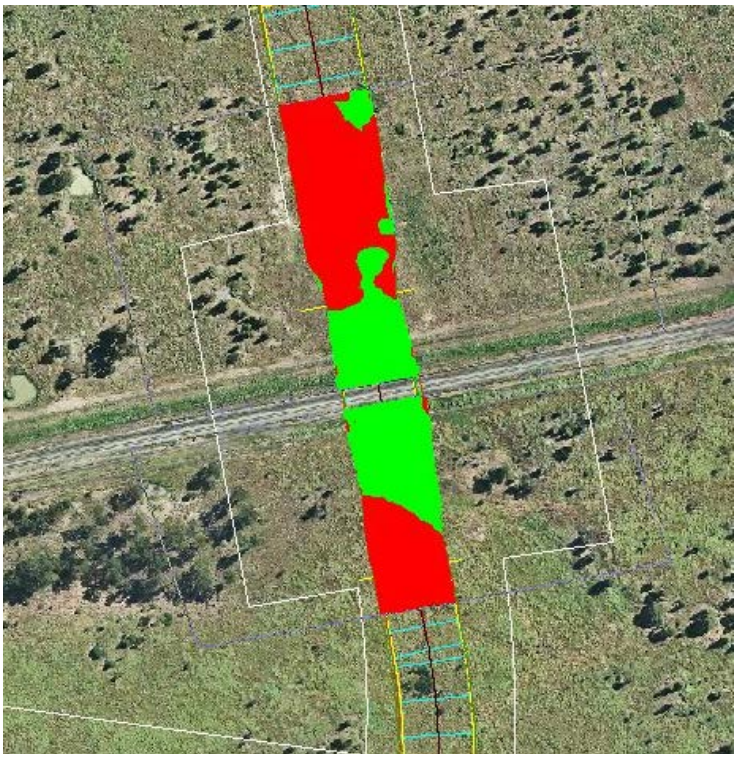

Figure 8 Crossing 3 - Goonyella Line (Rail CH130 / Alignment CH68.5) (Red: cut areas; Green: fill areas)

2.3.4.5 Drainage and erosion control

The abutments will partially obstruct the stormwater drainage channels adjacent to the rail formation. This obstruction will only be temporary as the abutments will be removed and the previous ground levels will be reinstated upon completion of the dragline crossing.

The Queensland Rail *Civil Engineering Technical Requirement - CIVIL-SR-001 - Design of road overbridges*[1] (CIVIL-SR-001) mandates that railway formation drainage has sufficient capacity to prevent the rainfall from a 50 year Average Recurrence Interval (ARI) rainfall event accumulating to the base of the ballast.

The expected probability of a flow event occurring during any given project design life can be calculated based on the formula below:

$$Probability\ of\ Event\ Occurance = 1 - \exp(-\frac{Design\ Life}{ARI})$$

The entire duration of the works, including the pre-works construction, removal and rehabilitation, is expected to occur in less than 1 month and is dependent on final construction sequence. It is scheduled to occur during the dry season. Conservatively, a design life of 1 year has been adopted.

[1] Queensland Rail. (2011). *Civil Engineering Technical Requirement CIVIL-SR-001 Design of Road Overbridges*.

For a design life of 1 year, the probability of a 1 year ARI occurring is 63%. Alternatively, for a 50 year design life, the probability of a 50 year ARI flood event occurring is 63% and for a 100 year design life, the probability of a 50 year ARI flood event occurring is 86%.

By assessing a 1 year ARI peak flood event for the adopted design life, a design storm with an equivalent level of probability of 63% has been analysed, as prescribed by CIVIL-SR-001 for longer term structures.

The resulting flood levels are shown with reference to the top of rail height in Table 8. It should be noted that the top of rail height and all other levels used in the assessment have been derived from LiDAR survey data. All levels will be confirmed once a ground survey is undertaken.

Table 8 Flood heights

Catchment	Top of Rail (R.L)	Flood Height R.L 1 Year ARI
Crossing 1A	249.75m	249.46m
Crossing 1B	249.80m	249.16m
Crossing 2A	264.30m	263.60m
Crossing 2B	264.50m	263.95m
Crossing 3A	209.20m	208.97m
Crossing 3B	209.20m	208.54m

The results of this assessment identify that the temporary constriction does result in afflux within the railway formation drain. However it does not result in any discharge or concentration of stormwater flows across the railway formation at any of the three crossings for the 1 year ARI event. Furthermore, the freeboard to the top of the rail for a 1 year event ranges from 0.29m at Crossing 1A to 0.70m at Crossing 2A.

The analysis also shows that the low flow HDPE pipes do not convey a substantial portion of flow at Crossings 1A, 3A and 3B at the peak flow rate. At these crossings, the majority of the flow is diverted beneath the steel plate that crosses the railway. However, low flow pipes will be provided to mitigate against the risk of ponding on the upstream side of the earth abutment.

2.3.5 Powerline crossings

The proposed alignment intersects 15 powerlines as detailed in Table 9.

Table 9 HV Powerline crossings

Crossing reference	Alignment chainage	Voltage	Owner
BHP Billiton Mitsubishi Alliance (BMA) - 66 Kilovolt (kV)	0.3 km	66 kV	BMA (GRM)
BMA - 66 kV	2.0 km	66 kV	BMA (GRM)
BMA - 132 kV	2.1 km	132 kV	BMA (GRM)
BMA - 132 kV	2.4 km	132 kV	BMA (GRM)
Powerlink - 132 kV	7.6 km	132 kV (Double Circuit)	Powerlink
Powerlink - 132 kV	19.1 km	132 kV (Double Circuit)	Powerlink
Ergon Energy - 19.1 kV	40.7 km	19.1 kV (Single Wire Earth Return (SWER))	Ergon
Ergon Energy - 66 kV	45.7 km	66 kV (Hybrid SWER, 1 x 66 kV)	Ergon
Ergon Energy - 33kV (Hybrid SWER)	45.7 km	11 kV (Hybrid SWER, 2 x 11 kV lines)	Ergon
Ergon Energy - 19.1 kV	47.4 km	19.1 kV (SWER)	Ergon
Ergon Energy - 11 kV	47.4 km	11 kV	Ergon
Ergon Energy - 19.1 kV	64.4 km	19.1 kV	Ergon
Ergon Energy - 19.1 kV	65.1 km	19.1 kV (SWER)	BMC
Ergon Energy - 66 kV	70.4 km	66 kV (Hybrid SWER, 1 x 66 kV)	Ergon
BMC - 66 kV	72.9 km	66 kV (SWC Dragline Feeder)	BMC

At locations of powerline crossings, it is expected the conductors will be isolated, lowered into trenches and protected or moved before the dragline traverses the power line alignment. For critical powerline crossings with limited outage opportunities, diversion circuits (e.g. buried cable

or re-routed power line) may be required. All work associated with Utility-owned powerline assets (i.e. Powerlink and Ergon Energy assets) will be carried out by the powerline asset owner by a contractor approved by the asset owner, using design approved by the asset owner. All work associated with BMA and BMC powerline assets will be managed directly by the Project proponent.

The contractor will take extreme care when working (e.g. operation of vehicles and plant) in the close proximity of power lines (e.g. inside a registered power line easement or within 25m of the powerline) and will adhere to all processes and procedures of the powerline asset owner (e.g. Powerlink, Ergon, BMA and BMC).

2.3.6 Services

A summary of the services crossings within the alignment is provided in Table 10.

Table 10 Services Crossings

Crossing reference	Crossing type	Alignment chainage
Fibre Optic Direct Buried (Telstra)	Goonyella Branch Line / Peak Downs Highway	Various
Mallawa Pipeline – Peabody Pipeline	Buried Pipeline adjacent to Mine Haul Road	22 km
Sunwater Pipeline (Sunwater / Eungella Water Pipeline P/L))	Buried Pipeline adjacent to Goonyella Train Line	40.5 km
Mallawa Pipeline – Peabody Pipeline (Peabody Energy Australia)	Buried Pipeline adjacent to Peak Downs Highway	43.7 km
Braeside Pipeline (BMC)	Buried Pipeline adjacent to Peak Downs Highway	43.7 km
Moorvale Mine Access Road Pipeline Crossing (Peabody Energy Australia)	Two above ground pipeline (PE) adjacent to Moorvale Mine Access Road	48.4 km
Braeside Pipeline – Stock Offtake (Private)	Buried Pipeline	65.9 km
Braeside Pipeline Crossing – BMC Main Pipeline (BMC)	Buried Pipeline adjacent to Peak Downs Highway	68.1 km
Braeside Pipeline Crossing – BMC	Buried Pipeline	72.8 km

Crossing reference	Crossing type	Alignment chainage
Main Pipeline (BMC)		
Private Stock (water) - 63 millimetre (mm) Poly Line	Buried Pipeline	75.2 km

The dragline move route crosses Sunwater's Eungella water pipeline where it runs alongside the Goonyella Branch rail line and the Peak Downs Highway. In addition, the Mallawa Pipeline (Peabody Energy Australia) will be crossed at a single location and the Braeside Pipeline (BMC) will be crossed at four locations. In all instances the pipelines will be protected using an earth fill cover, steel plates or a combination of both.

The dragline move route crosses two above ground pipelines adjacent to the Moorvale Mine access road. These will be buried and covered as per the treatment detailed above.

The dragline move route also crosses buried fibre optic communication lines running alongside the Goonyella Branch (rail) Line, the Peak Downs Highway and the SWC access road. The same approach will be taken to protect the integrity of the lines, with depth of additional protection governed by the required formation level within the immediate area.

2.3.7 Shutdown and load/unload pads

Shutdown and load/unload pads will be constructed at specific locations along the alignment. The purpose of the shutdown pads is to station the dragline in order to carry out maintenance. The load/unload pads are designed to load the dragline off and onto the transporter. Maintenance will include refurbishing short-lead equipment (first pad), installing new long-lead equipment (second pad) and preparing the dragline for operational readiness (third pad).

2.3.7.1 Pads location

The first and third pads will be located within the GRM and SWC mining leases, respectively. These will be installed in areas free of MNES. The maps in the Terrestrial Ecology MNES Assessment Addendum (Appendix C) show extensive areas free of MNES. The second pad will be located along the alignment, outside mining leases. The proposed options for location of the second pad are Lot 1 SP251730 (Freehold) or Lot 2 SP214498 (Freehold) as illustrated in Figure 9 and Figure 10, respectively.

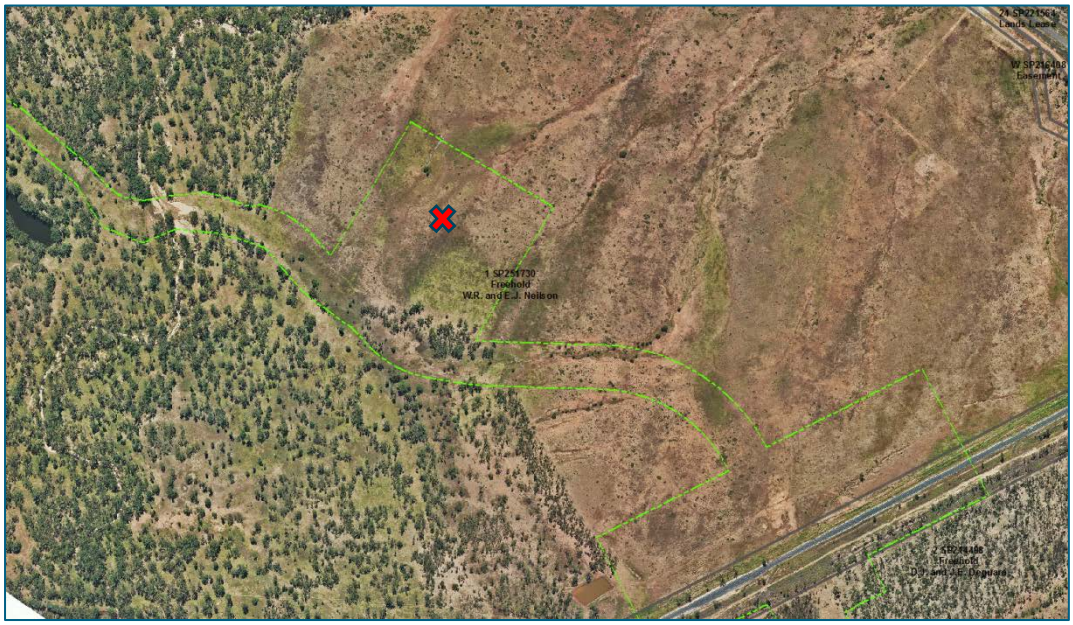

Figure 9 Shutdown pad location option 1 - Lot 1 SP251730 (Freehold) (red cross)

Figure 10 Shutdown pad location option 2 - Lot 2 SP214498 (Freehold) (red cross)

All shutdown and load/unload pads will be located in previously cleared areas, outside remnant vegetation areas.

2.3.7.2 Pads configuration

Pad preparation will involve clearing and grubbing, stripping, placement of select fill and placement of pavement layer. The final lines and levels of the pad will ensure the pad is above

1:100 flood levels and free draining. The pavement will extend over the entire surface of the pad to provide an all-weather working platform, and vary in thickness locally to account for specific design loads. Key requirements for each pad are summarised below:

- Shutdown pad:
  - Dimensions: 150m x 250m
  - Allowable bearing pressure of 450 kPa
- Load/unload pad:
  - Tracked crawler:
    - Dimensions: 142m x 50m
    - 300kPa bearing pressure required across pad
    - No cross-fall under mat locations / 1% fall elsewhere
    - 2.3m deep excavation for loading ramp
  - SPMT:
    - Dimensions: 50m x 40m
    - 700kPa required for jack-up locations
    - 1.4m deep excavation for jacking pits.

The pavement layer will consist of a Type 2.5 to Type 2.3, depending on design requirements and the material shall be placed as near as possible to Standard Optimum Moisture Content, (with a permissible range of Optimum Moisture Content -2% to + 1%) and compacted to a density ratio of not less than 100% of Standard modified Dry Density to Australian Standard (AS) 1289.5.1.1. Pavement layer material will be placed in continuous, approximately horizontal layers having a compacted thickness of not more than 200mm. Each layer of pavement layer material will be compacted with a smooth drum roller or other equipment determined appropriate by compaction trials.

2.4 Description of civil works – dragline move corridor

The description of civil works is based on the use of a tracked crawler, which constitutes the worst case scenario with regard to clearing and ground disturbance compared to a SPMT.

2.4.1 Civil works overview

The Project's civil construction works and the move operations will involve the following:

- Vegetation clearing
- Removal of obstacles such as rocks and logs
- Earthworks, including:
  - Soil stripping
  - Trenching

  - Stockpiling
  - Cut to fill and placement of material
  - Borrow to fill and placement of material
  - Transport of soil and fill material
  - Ground compaction
- Establishment of temporary site offices, laydown and parking areas
- Rehabilitation.

Civil works for the construction of the travel path will be undertaken between one and seven days (approximately) before the passage of the dragline transporter. Works will precede the passage of dragline transporter along the move route, starting at GRM and progressing towards SWC. Rehabilitation works will be progressively completed, typically within a month of the dragline passage.

2.4.2 Clearing and soil stripping

The Project will require clearing of all vegetated sections of the dragline move route to a minimum 40m width (35m travel width plus 5m side clearance). The required corridor width will be greater than the minimum 40m in some sections of the alignment due to ground conditions (i.e. for stockpiling of stripped topsoil). In vegetated areas, the required corridor width will in some cases be 60m or 80m to allow for vehicular traffic past the dragline and cleared vegetation stockpiling on the edges of the dragline pathway. However, in ecologically sensitive areas, the minimum 40m width corridor will be applied for the majority of cases in order to limit disturbance. In those areas, "breakout" stockpiling areas of cleared vegetation are required when the 40m wide section of corridor is 500m long or more. This approach will result in a lesser total disturbance to ecologically sensitive areas than a standard rule involving a breakout area approximately every 500m.

Trees and obstacles will be moved with a dozer. Clearing of established trees will be minimised to those required to achieve the required corridor width. Removed vegetation, topsoil and obstacles will be windrowed along the edges of the corridor within 1km of the strip location for later use during rehabilitation.

In areas with unsuitable ground conditions, the material will need to be stripped. The underlying material may need to be graded and compacted to provide a firm finished surface. The unsuitable material will be stripped with a dozer or grader and stockpiled adjacent to the corridor, where adequate space is available, or hauled to designated stockpile areas. Soft spots will require additional compaction or alternatively, unsuitable material will be removed and replaced with compacted select fill. Stripping depths are expected to range from no stripping to a maximum depth of 500mm. Initial estimates indicate an average strip depth of 0.25m across the full extents of the alignment. Where no topsoil stripping is required, earthworks will be limited to filling of sharp gullies.

2.4.3 Select Fill

Where additional fill is required for local pavement, ramps, waterway crossing or service crossing construction, material will be sourced from designated local borrow areas, located within 1km of the construction location. Borrow areas will be located in previously cleared areas, outside remnant vegetation and away from watercourses.

2.4.4 Crossing works

Standard earthworks equipment will be used to construct the infrastructure crossing. This may include dozers, graders, compactors, excavators, dump trucks and water carts. It is expected the number of plant would not exceed 15 units at any individual time.

2.4.4.1 Railway crossings

Earthworks on either side of the railway corridor boundaries will be carried out by BMC's contractor. The execution methodology for the works within the rail corridor is yet to be finalised, however it is anticipated that the works from the rail corridor boundary to within 3m of the track will be carried out by BMC's contractor in a site protocol arrangement, with the works within 3m of the tracks being carried out by Aurizon as the principal contractor.

2.4.4.2 Powerline crossings

The Powerline Utility owners (Powerlink and Ergon Energy) will be responsible for handling their own conductors. Protection works (to aerial conductors installed in temporary trenches or buried cables) may be undertaken by BMC's civil contractor if required.

For BMA/BMC powerline crossings, a Contractor will be engaged directly by the Project to undertake this work.

2.4.5 Laydown areas and site offices

Laydown areas may be located outside of the corridor footprint, however locations will be selected to avoid disturbance to established vegetation. All fuel and lubricant storage facilities will be bunded. Site offices will include portable buildings for offices and ablutions. Sewage will be stored and transported to licensed disposal facilities.

2.4.6 Construction water

Where available, existing standpipes will be used to source water from the BMC-owned Braeside Pipeline. As a least preferred option, construction water will be sourced locally from pastoral lease dams under agreements with landholders.

2.4.7 Access to site

Access to various sections of the dragline move route will be from existing roads and property tracks as well as via the dragline pathway itself. Indicative locations are illustrated in Figure 11, Figure 12 and Figure 13. Additional existing additional tracks and road may also be used.

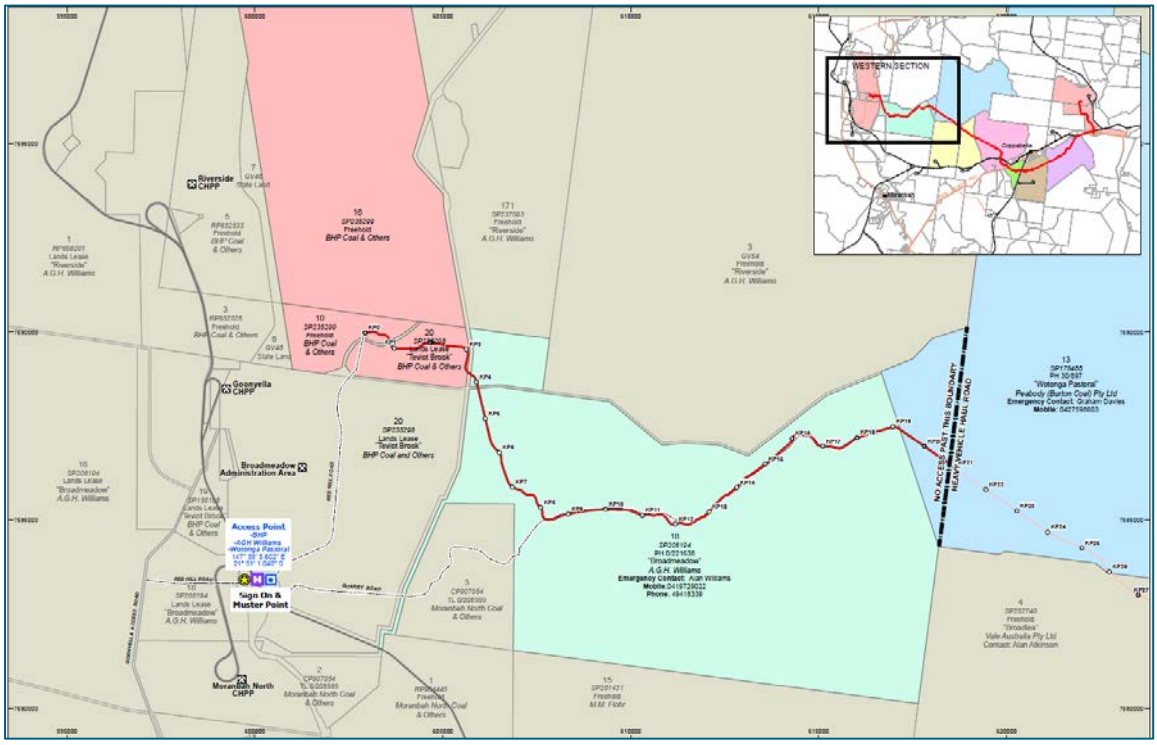

Figure 11 Access Map (Chainage CH0 – CH20)

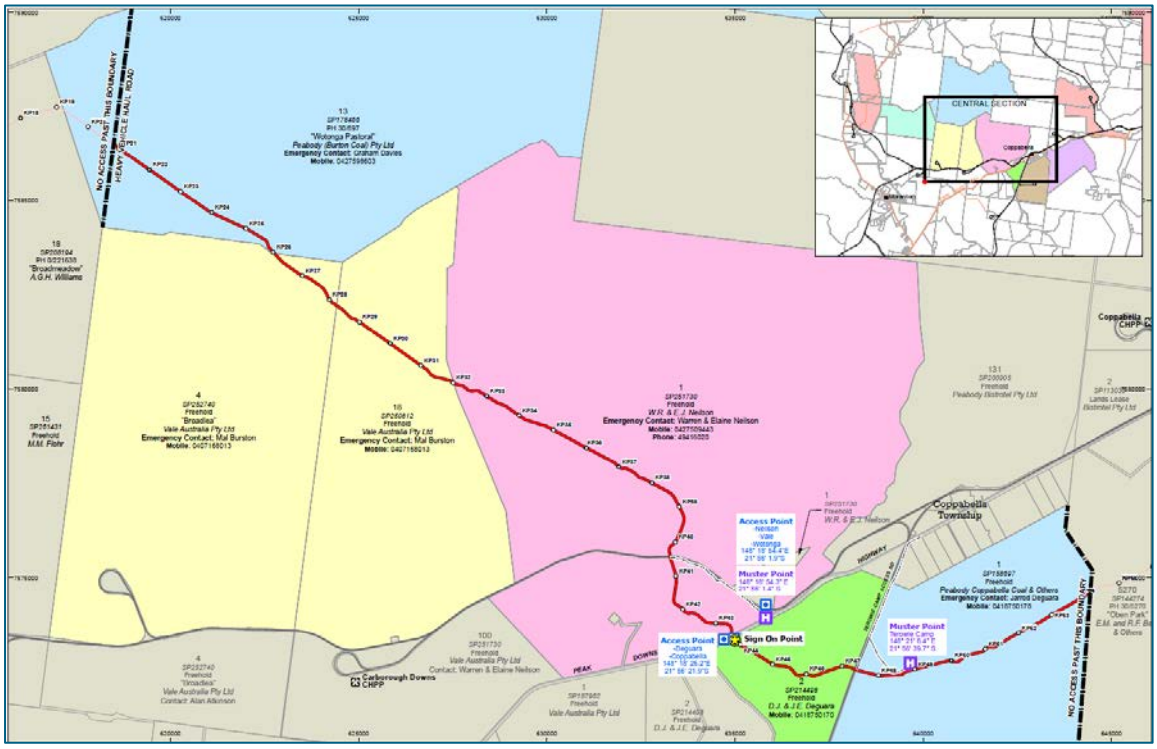

Figure 12 Access Map (Chainage CH20 – CH64)

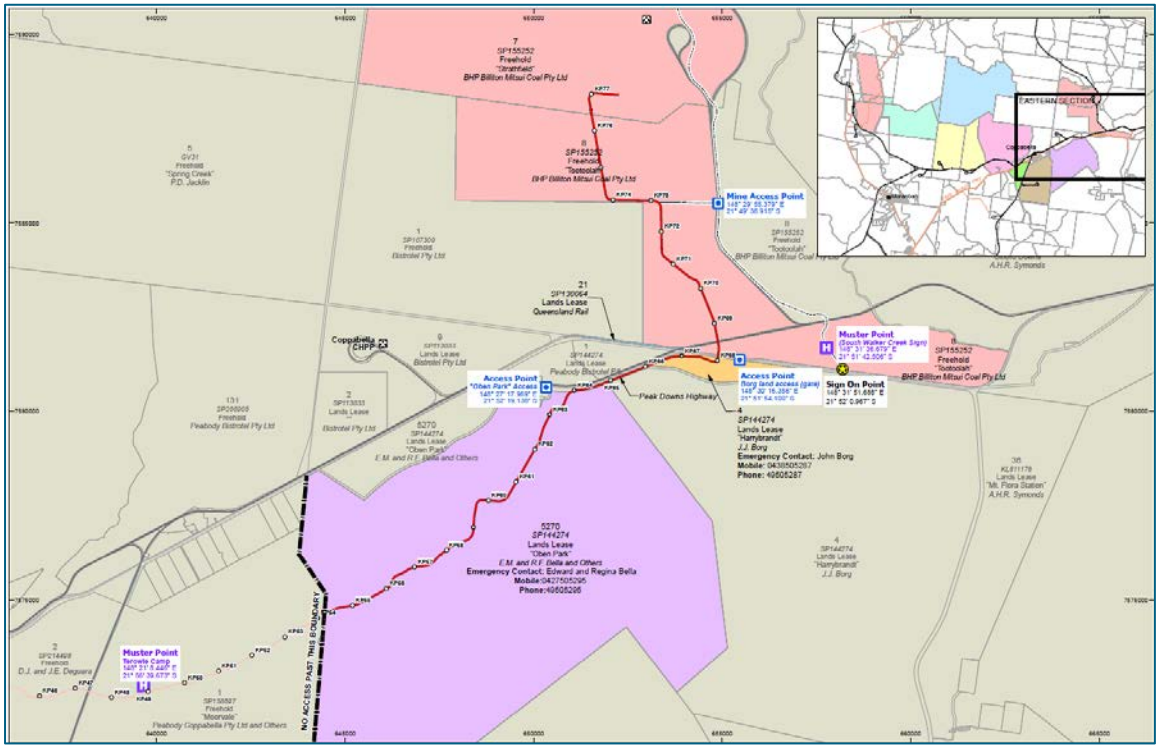

Figure 13 Access Map (Chainage CH64– CH77)

2.5 Description of dragline move operations

The dragline may be transported using a Lampson tracked crawler transporter as illustrated in Figure 14.

Figure 14 Dragline on tracked crawler transporter

The tracked crawler transporter is a self-propelled track-mounted platform that supports the dragline. A SPMT may be used instead of a tracked crawler and consists of self-propelled tyre-mounted platform. The average speed of dragline transporters on flat ground is 5km per shift without any infrastructure crossings. The route length is approximately 77km, therefore transportation time will be 16 days, excluding infrastructure crossings and delays.

2.6 Rehabilitation

Following completion of the dragline movement, the transportation corridor will be rehabilitated by respreading:

- Cleared vegetation (only where necessary to enable the regeneration of vegetation equivalent to the vegetation that was cleared)
- Stripped topsoil (which will include the seedbank), with seeding in selected locations to occur progressively after the passage of the dragline.

In areas where the ground has been compacted and/or topsoil has not been stripped, the area will be tyned to loosen compacted soil.

During site investigations, intersected soils where tested for parameters likely to indicate both instability and hostility to plant growth. Based on these measured and inferred values, treatments will be specified for each classified soil including rehabilitation process and rates of gypsum dosing where required.

Watercourses and drainage lines will be a particular focus for rehabilitation activities to ensure bank stability and revegetation where vegetation has been cleared for the Project. Rehabilitation of watercourse crossings will involve the following:

- Fill placed in the bed of the watercourse will be removed and placed back in the appropriate borrow area
- The ground profile will be returned to its original levels
- Erosion and sediment control measures/devices will be installed, where/as required by ground conditions (e.g. ripping of slopes, placement of rocks/gravel, erosion control blankets, hydromulching, etc.)
- Measures will be implemented to reinstate cleared riparian vegetation - subject to local ground conditions, this may include placement of cleared vegetation over the disturbed area (including seedbank), seeding (e.g. hydroseeding) and/or planting of seedlings.

Any placed and compacted select fill will be removed and returned to the borrow area. The borrow area will be locally shaped to maintain existing drainage lines. The upper layer will be tyned with a grader prior to seeding. Imported fill will be removed and trucked to a stockpile area designated by the landholder.

Refer to the Rehabilitation Management Plan at Appendix D for further details.

2.7 Project traffic

The Project's generation of additional traffic on the nearby road network will be negligible. Traffic at the Peak Downs Highway crossings will be managed in accordance with DTMR's specifications and the Manual of Uniform Traffic Control Devices.

Table 11 provides an overview of expected traffic during mobilisation/demobilisation and implementation phases.

Table 11 Estimated vehicle traffic

Vehicle type	Mobilisation / Demobilisation	Implementation phase
Labour transport: mini-bus	3	3
Labour transport: light vehicle	15	15
Transport: heavy vehicle	15	-

2.8 Work Force and hours of operation

2.8.1 Site personnel

The approximate number of personnel involved on site will be 30. It is anticipated that site personnel will reside, or be accommodated overnight in Moranbah, Coppabella or Nebo.

2.8.2 Hours of operation

Construction hours will be 7 days a week, between 6am and 5pm. No night work is planned. However, temporary lighting plant may be provided as a safety measure at the Peak Downs Highway crossing points if the diversion roads are to remain active at night. Depending on the outcomes of current discussions with Powerlink there may also be a need to cross powerline infrastructure at times of low network demand (e.g. at night).

3 Supporting studies

3.1 LIDAR survey

A LiDAR survey has been carried out across the extent of the full alignment. This level of detail is suitable for the design of the general pavement. Detailed ground investigations at infrastructure crossings and buried services will be completed prior to finalisation of detailed design. This will ensure adequate protection is provided to buried services and infrastructure crossings are completed safely and efficiently.

3.2 Geotechnical investigations

Geotechnical field testing has been completed, incorporating Dynamic Cone Penetrometer tests at 500m spacing in conjunction with 1.5m auger holes at 1000m spacing along the alignment. Dynamic Cone Penetrometer tests were manually completed by a single operator and drop a hammer from a fixed height, counting the number of blows taken for each 100mm of penetration. These results were then used to estimate an allowable bearing capacity for each layer based on the relationship presented in *Determination of Allowable Bearing Pressure Under Small Structures, M.J. Stockwell, New Zealand Engineering, 15 June 1977*.

In addition, specific testing has been completed at critical locations including infrastructure and creek crossings, and in the vicinity of diversion roads. This has been completed to ensure adequate bearing conditions are available in abutment locations and suitable select fill is available for crossings.

From a constructability point of view, stripping has been limited to 500mm. If competent ground is not achieved at this depth, additional compaction using an impact roller will be completed. Based on preliminary results, an average strip depth of 0.25m will be required across the alignment.

Soil sampling was completed and sent off for laboratory testing to determine suitability for reuse and to optimise rehabilitation specifications for the alignment. On receipt of the laboratory results, a factual geotechnical report will be prepared.

The investigations have been completed under the supervision of a Registered Professional Engineer of Queensland (RPEQ) qualified engineer.

3.3 Route optimisation

Avoidance of impacts to environmentally sensitive areas (e.g. remnant vegetation, watercourses/riparian corridors, fauna habitat) from clearing was a key consideration when conducting the route selection study and defining the required clearing corridor.

Key to this approach was the decision to use a pre-existing corridor that had been cleared in 2000 for the purpose of a similar dragline relocation carried out between the two same mines. Therefore, the large majority of the proposed corridor is located within the same footprint as the corridor

used in 2000 (approximately 70%). The large majority of this pre-existing corridor does not contain any MNES.

The only deviations from the pre-existing corridor were due to the requirement to avoid infrastructure constructed after the dragline relocation in 2000. As such, these deviations were unavoidable. However, where possible, deviations have been located so as to avoid or limit clearing of MNES and disturbance to environmentally sensitive areas.

An iterative review of the corridor was undertaken to maximise avoidance of environmentally sensitive areas and MNES. A series of reviews of the corridor were undertaken using information collected by ecologists during their desktop assessment. This involved optimising the corridor alignment and width based on MNES mapping and environmentally sensitive areas identified from high-resolution aerial imagery.

To further avoid or reduce vegetation clearing and associated impacts, the following were undertaken:

- Alignment sections traversing areas of MNES were limited to the absolute minimum width practicable for travel of the dragline (40m). In those sections, "breakout" stockpiling areas of cleared vegetation are required when the 40m wide section of corridor is 500m long or more. These vegetation stockpiling areas will increase the corridor width locally, however this approach was found to result in a lesser total disturbance to MNES.
- The transport corridor was located wholly or partly onto existing cleared corridors such as powerline easements, road corridors and fence lines.

Based on field survey findings, the dragline move route was further optimised to avoid sensitive locations identified by ecologists and geotechnical engineers, such as drainage lines and specimens of protected plant species.

3.4 Ecological assessment

An ecological assessment was carried out for the purpose of the Project and gave consideration to MNES and Matters of State Environmental Significance (MSES). The assessment involved a desktop assessment and field surveys along the full length of the corridor. The report assessing MNES is attached at Appendix E, with an addendum to this report attached at Appendix C.

3.5 Offset Delivery Plan

The proponent's offset delivery plan covering the impacts of the Project on MNES is based on a proposed direct offset. The Offset Delivery Plan for MNES is attached at Appendix F.

4 Matters of National Environmental Significance

4.1 Quantification of potential impacts

4.1.1 Deviations from the 2000 route alignment

Deviations from the year 2000 route alignment were required in some locations illustrated in maps attached at Appendix H. These deviations were required for the following reasons:

- Cross powerlines at defined point (further north than previous corridor); avoid new infrastructure and operations encroaching on the year 2000 corridor (refer maps 1.1 and 1.1a) – it should be noted that the new corridor avoids larger area of Threatened Ecological Community (TEC) and habitat
- Cross powerlines south of an additional powerline instead of using a northern route used in 2000 because the northern route option requires an additional powerline outage (refer maps 1.2 and 1.2a)
- Avoid a new powerline and village accommodation located in the year 2000 corridor (refer maps 1.3 and 1.3a)
- Avoid clearing of vegetation including MNES by using an already cleared corridor – this difference in alignment is due to inconsistency between the GIS mapping of the year 2000 route and the cleared corridor shown on the aerial imagery (refer maps 1.4 and 1.4a)
- Avoid new infrastructure encroaching onto the year 2000 corridor – it should be noted that the new corridor was chosen to minimise impact to MNES habitat and TEC (refer maps 1.5 and 1.5a).

It is estimated that approximately 47km or 61% of the 2017 route follows the year 2000 cleared corridor. The "new" sections of the proposed route amount to approximately 27km out of the total 77km. Of this, about 12km involves new MNES disturbance, which equates to approximately 16% of the route.

4.2 Assessment of potential impacts

Preliminary note: It should be noted that, since the referral was lodged in September 2016, the dragline move corridor was amended in distinct locations. These amendments are minor and, with two potential exceptions, do not change the impacts to MNES quantified and assessed under the ecological assessment submitted with the referral. The two potential exceptions relate to two yet to be finalised powerline crossings. The potential impacts of the changes are set out in a Terrestrial Ecology MNES Assessment Addendum attached at Appendix C.

4.2.1 Overview

The ecological assessment of MNES carried out for the Project provides a detailed assessment over the project area, which is summarised below.

The project area contains no World Heritage Properties, National Heritage Properties or Wetlands of International Significance. However, several Threatened Ecological Communities (TECs), threatened species and migratory species are recognised as having potential to occur.

The following TECs are identified by DoEE's Protected Matters Search Tool as having potential to occur in the study area:

- Brigalow (*Acacia harpophylla* dominant and co-dominant)
- Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions.

The EPBC Act Protected Matters Search Tool identifies four EPBC Act threatened flora and 16 threatened fauna species as having potential to occur in the study area.

The desktop assessment carried out found that the following three threatened flora species should be considered to have potential to occur:

- King Blue-grass *Dichanthium queenslandicum* (Endangered)
- Blue-grass *Dichanthium setosum* (Vulnerable)
- Black Iron-box *Eucalyptus raveretiana* (Vulnerable).

The following four EPBC Act threatened fauna species were considered likely or to have potential to occur:

- Squatter Pigeon *Geophaps scripta* (Vulnerable)
- Ornamental Snake *Denisonia maculata* (Vulnerable)
- Koala *Phascolarctos cinereus* (Vulnerable)
- Yakka Skink *Egernia rugosa* (Vulnerable).

Nineteen migratory fauna were considered as part of the assessment. The desktop assessment carried out found that four migratory species should be considered as likely or potential to occur:

- White-throated Needletail *Hirundapus caudacutus*
- Fork-tailed Swift *Apus pacificus*
- Eastern Great Egret *Ardea modesta*
- Oriental Cuckoo *Cuculus optatus*.

The Protected Matters Search Tool identified potential habitat for the Fitzroy River Turtle and Southern Snapping Turtle along the alignment. However the ecological assessment concluded that both species were unlikely to occur due to a lack of suitable habitat.

Subsequently to field surveys, it was found that the project is predicted to have a significant residual impact on threatened species Ornamental Snake and Yakka Skink and the Brigalow TEC. However, no significant residual impacts are predicted on the Koala and Squatter Pigeon (Southern Subspecies) or migratory species. The other species listed above were not found to be present on site.

A detailed profile of each MNES is provided in Appendix E of the attached Terrestrial Ecology MNES Assessment (Appendix E).

Section 6 of the Terrestrial Ecology MNES Assessment provides a detailed description and assessment of the extents of impacts on each MNES. The Terrestrial Ecology MNES Assessment Addendum (Appendix C) provides further quantification of impacts to MNES.

Project impacts on the above MNES will:

- Include direct impacts caused by necessary vegetation clearing
- Be associated with the one way movement of the dragline - following rehabilitation of the corridor, the vegetation would not be subject to further disturbance
- Be localised due to habitat and vegetation proposed to be cleared being located along the edges of previously cleared corridors (dragline move corridor cleared in 2000, powerline and road easements, fence lines) or in distinct vegetated areas that cannot be avoided.

The assessed impacts are those that cannot be avoided. Wherever possible, avoidance of MNES was achieved during the planning/design phase by optimising the route alignment and corridor width to the maximum practicable. The unavoidable residual impacts are proposed to be offset (refer section 6).

4.2.2 Clearing likely to be less than proposed

It should be noted that, in sections of the corridor proposed to be 80m wide, the amount of clearing proposed corresponds to a worst case scenario that is unlikely to eventuate. The 80m-wide corridor is used to allow for flexibility in the trajectory of the dragline transport and to provide for areas of cleared vegetation/material stockpiling and laydown areas. Aside from alignment bends requiring extra width and areas needed for stockpiling/laydown, the actual clearing required for the standard corridor width will be typically 40m for a tracked crawler and 26m for a SPMT. Therefore, the proponent anticipates that the actual clearing will be less than what is sought to be approved. Consequently, actual offset requirements are also likely to be less than what will be proposed in the Offset Delivery Plan for MNES (Appendix F). Should this be the case, a revised Offset Delivery Plan would be proposed.

4.2.3 Assessment of impacts to Koala

The Terrestrial Ecology MNES Assessment Addendum (Appendix C) provides additional information addressing items 2.1, 2.2 and 2.3 of DoEE request for additional information and supporting the view that the Project will not have a significant impact on the Koala.

The Terrestrial Ecology MNES Assessment Addendum notes that 8.5ha of the 104.13ha of core and essential Koala habitat proposed to be cleared constitutes eucalypt woodland along the large riparian zones (watercourses of stream order 4 and above) that are understood to constitute high quality habitat for Koala movement and dispersal. It should be noted that these locations are found on the previous dragline move corridor cleared in 2000. Other main deviations from the 2000 move corridor (i.e. south of the Coppabella mine camp and within the SWC mining lease) do not include any important riparian corridor.

4.3 Consideration of cumulative impacts

4.3.1 Approach

The following discussion considers the incremental impacts of the Project on MNES when combined with other past, present or reasonably foreseeable actions in the region. This information is intended to be high-level and qualitative in order to provide landscape-scale context for the Project.

In order to place the Project in the context of potential incremental or cumulative impacts, the analysis identified 'other actions' as relevant in the sense that they:

- Are currently occurring or proposed to occur in the same region as the Project; and
- Have the potential to impact on the same MNES values as the Project.

The following parameters were defined for the purposes of this assessment:

- The relevant region was broadly considered to be within a 50 km radius of the Project
- The 'other actions' were identified through a search of proposed developments on DoEE's referrals database on 28 November 2016 and with reference to the Department of Mines and Natural Resources' *Queensland coal – mines and advanced projects* July 2016 fact sheet. Key words searched included Moranbah, Dysart, Winchester, Bowen, Middlemount and other mine specific names.
- Of these 'other actions' identified, those considered useful for this high level analysis included referrals likely to result in significant impacts to MNES (as denoted by controlled action decisions).

The use of DoEE's referrals database was considered an appropriate source for information on relevant 'other actions' based on the premise that any action with the potential to impact on MNES will have been referred under the EPBC Act. This does mean that only proposals made following

enactment of the EPBC Act in 2000 are able to be included. The level of development prior to 2000 is therefore considered to represent the region's baseline for this assessment.

This analysis made use of publicly available information only.

4.3.2 Relevant 'other actions'

Table 12 lists the relevant 'other actions' identified using the process outlined above. The timeframe column has been populated with reference to the *Queensland coal – mines and advanced projects* July 2016 fact sheet, in addition to general internet searches to determine whether actions fell into one of three categories:

- Past – the action has been completed;
- Underway – the action is currently under construction or operation; or
- Potential future – on-ground works are yet to commence. This means there is some potential that the actions and their associated impacts may never eventuate.

All other fields were populated using information available on DoEE's website.

Table 12 Relevant other actions

EPBC Referral #	Location	Project name	Action type	Potentially impacted MNES (taken from referral or approval information)	Timeframe
2002/728	Moranbah to Townsville	Gas Pipeline	Pipeline	Black ironbox Black throated Finch	Past
2004/1770	Near Moranbah	Poitrel Coal Mine	Open cut coal mine	Brigalow TEC Squatter Pigeon	Underway
2005/2059	Moranbah to Gladstone	Central Queensland Gas Pipeline	Pipeline	Brigalow TEC Natural Grasslands TEC Semi-evergreen Vine Thicket TEC Black ironbox *Cycas megacarpa*	Potential future
2007/3785	Moranbah	The Grosvenor coal mine project	Longwall coal mine	Brigalow TEC Natural Grasslands TEC	Underway
2008/3945	Moranbah	Peak downs east project	Longwall mining	Brigalow TEC Natural Grasslands TEC	Potential future
2008/4417	South	Caval Ridge coal mine	Open cut coal mine	Brigalow TEC	Underway

EPBC Referral #	Location	Project name	Action type	Potentially impacted MNES (taken from referral or approval information)	Timeframe
	Moranbah			Natural Grasslands TEC	
2009/4821	Moranbah	Millennium coal mine	Open cut coal mine	Brigalow TEC Squatter Pigeon	Underway
2009/4892	57km east of Moranbah	Codrilla Open Cut coal mine	Open cut coal mine	Brigalow TEC Ornamental Snake habitat	Potential future
2012/6321	Goonyella to Abbot Point	Central Queensland Integrated Rail Project	Rail link	World Heritage Properties (Great Barrier Reef (GBR)) National Heritage Places (GBR) Commonwealth Marine Areas (GBR) Great Barrier Reef Marine Park Listed migratory species Natural Grasslands TEC Brigalow TEC Semi-Evergreen Vine Thicket TEC Potential habitat for a range of threatened flora and fauna species, including Ornamental Snake	Potential future
2012/6337	South of	Moranbah south	Underground coal	Natural Grasslands TEC Brigalow TEC	Potential

EPBC Referral #	Location	Project name	Action type	Potentially impacted MNES (taken from referral or approval information)	Timeframe
	Moranbah		mine	King Blue-grass Blue grass *Dichanthium setosum* Squatter Pigeon Ornamental snake Red Goshawk Koala	future
2012/6377	Glenden south to Blackwater	Bowen Basin Gas Project	CSG	Potential impacts to a wide range of threatened species and TECs, including Ornamental Snake, Koala, Brigalow TEC	Potential future
2013/6865	20 km north of Moranbah	Red Hill Mining Lease	Mine expansion (longwall	Brigalow TEC Natural Grasslands TEC Blue grass *Dichanthium setosum* Squatter Pigeon Ornamental Snake Koala	Potential future
2013/7025	25 km west-south-west of Nebo	Kemmis 2, South Walker Creek open cut coal mine	Open cut coal mine (new pit)	Brigalow TEC Natural Grasslands TEC	Underway

EPBC Referral #	Location	Project name	Action type	Potentially impacted MNES (taken from referral or approval information)	Timeframe
2014/7132	27km north-west of Nebo	Broughton Coal Mine Project	Open cut coal mine	Brigalow TEC SEVT TEC Listed migratory species Water resource	Potential future
2014/7240	35 km north-west of Nebo	Hail Creek Coal Mine Extension Transition Project	Extension of existing mine (open cut, highwall and underground)	Black ironbox Water resource	Underway
2014/7272	25 km west-south-west of Nebo	South Walker Creek Mulgrave Pit Extension	Further development of the Mulgrave open cut pit	Brigalow TEC Ornamental snake	Underway
2016/7701	North-east of Dysart	Lake Vermont Coal Mine Northern Extension Project	Extend the Lake Vermont Coal Mine, an existing open-cut coal mine	Water resource	Potential future

4.3.3 Context for the Project

Seventeen projects were identified as being relevant 'other actions' within the region of the Project. Of these, 8 proposed actions are yet to commence. As a result, they involve anticipated impacts that may contribute to existing pressures on the status and viability of the MNES in the region.

Available information suggests that the Project will contribute to the incremental or cumulative impacts of other potential future actions in relation to:

- Brigalow TEC, with impacts to known or potential habitat from 14 of the 17 past or proposed actions in the region
- Ornamental Snake, with impacts to known or potential habitat from 6 of the 17 past or proposed actions in the region.

Incremental or cumulative impacts appear to be a more relevant consideration for.

At a high level, the scale of current proposed development in the region appear to be placing large, incremental pressure on Ornamental Snake habitat and the Brigalow.

BMC is committed to the provision of offsets for Brigalow TEC and Ornamental Snake habitat to compensate for the potential impacts of this Project. These offsets will help to address the potential incremental loss by protecting and managing in perpetuity large areas of land that support these MNES in the region. Importantly, they will be delivered in accordance with the principles set out in the EPBC Act Environmental Offsets Policy (October 2012); most notably, the principle that offsets must deliver an overall conservation outcome that improves or maintains the viability of the MNES that is being impacted. Refer to section 6 for details on the Project MNES Offset Delivery Plan.

5 Avoidance and Mitigation of Impacts - CECP

5.1 Overview

To ensure the planning and delivery of the Project is responsibly and effectively managed with respect to the protection of environmental values (including MNES), BMC will incorporate the measures set out in this section 5 in a Project-specific Construction Environmental Control Plan (CECP) prior to work commencing on site. The CECP is the document that DoEE refers to as "EMP". The CECP is the document that governs environmental aspects of Project execution, including roles and responsibilities for ensuring environmental compliance of the Project. The CECP will be a live Project document regularly updated throughout Project execution.

The MNES related measures set out in this section 5 seek to address environmental legislative requirements and will be updated as necessary in the CECP to address relevant conditions under Commonwealth and/or Queensland State Government approvals.

In addition to the MNES related measures, the full set of management measures will meet the environmental objectives and performance criteria developed to manage potential impacts associated with the following environmental aspects:

- Flora and fauna (including weeds)
- Water quality
- Soil erosion and sedimentation
- Air quality
- Noise and vibration
- Cultural Heritage
- Waste
- Hazardous materials.

The management measures will include detail of specific environmental controls, performance indicators and monitoring requirements. The environmental objectives, performance criteria, and performance indicators and monitoring requirements relevant to MNES are detailed below.

Additionally, the CECP will describe the overarching measures and processes established with regard to incident response, corrective actions, environmental auditing and environmental reporting. These matters in relation to MNES are addressed below.

BMC and BMC-managed contractors will be responsible for implementing the mitigation and management controls during all construction activities.

5.2 Format and content of CECP

The CECP will be further developed as the detailed design and planning of works progresses sufficiently to allow appropriate definition of management measures. It will be prepared in collaboration with the various contractors (clearing, civil works, dragline transport), once engaged. It will be a stand-alone document developed to define the requirements for contractors in the preparation of their own environmental management plans. The CECP will address the information requirements outlined within DoEE's *Environmental Management Plan Guidelines* (2014).

The following sections provide an overview of the content of the CECP as relevant to DoEE's key interest, being management of impacts to MNES flora and fauna. In its final form, the CECP will address all environmental aspects relevant to the Project as listed in section 5.1.

5.2.1 CECP presentation

In accordance with DoEE's *Environmental Management Plan Guidelines*, from the commencement of Project execution, the CECP will include:

- A cover page providing the project name (approved action), the location of the Project, BMC's ABN, revision number and date of the document as well as the Project's EPBC number
- On the second page, a declaration of accuracy signed by the BMC Project Manager
- A table of contents.

The CECP will also include a revision block recording the revision number and date as well as the past revision numbers and dates.

5.2.2 Introduction

The CECP will incorporate the following introductory text:

The execution of the Project involves the following key activities:

- Clearing and grubbing of the move route and other areas to be used during construction and the move
- Construction of the dragline move pathway
- Transport of the dragline on transporters travelling on the move pathway
- Rehabilitation of all disturbed areas after passage of the dragline.

Table 13 summarises the main potential Project impacts and associated management measures relevant to MNES planned to be implemented to avoid or mitigate potential impacts arising from these activities.

Table 13 Potential project impacts and key management measures

Potential project impacts	Key management measures
Fauna and flora	
Accidental non-compliance with clearing boundaries leading to excessive (unauthorised) vegetation clearing, including MNES habitat.	▪ Physical delimitation of approved clearing areas/ boundaries ▪ Monitoring of clearing activities.
Harm to fauna from clearing activities and vehicle traffic.	▪ Pre-clearing surveys by fauna spotter-catchers ▪ Monitoring of clearing activities by fauna spotter-catchers ▪ Speed restrictions.
Project-generated bushfire causing loss of vegetation and fauna/fauna habitat.	▪ Fire-prevention measures for relevant activities ▪ Fire-extinguishing equipment and water carts on site.

5.2.3 Condition of approval cross-reference table

The CECP will contain a condition of approval cross-reference table indicating where each approval condition is addressed in the document. All EPBC Act approval conditions will be listed, along with conditions from State approvals such as the Development Approval under the SP Act, the Protected Plant Clearing Permit and the Permit to Tamper with Animal Breeding Places under the *Nature Conservation (Wildlife Management) Regulation 2006*. The reference table will list the key measures planned to meet the approval conditions.

5.2.4 Project description

The CECP will contain a summary description of the Project that will include some of the key project information contained in section 2. Using input from the detailed design and site activities planning, more detailed information will be included about the type of work planned and sequencing of activities, particularly those with an impact on MNES.

5.2.5 Environmental management roles and responsibilities

The CECP will include information with regard to roles and responsibilities on environmental management during Project execution. Table 14 provides preliminary role descriptions which will

be further defined and detailed as formal positions, roles and responsibilities are better defined in liaison with the contractors once they have been engaged.

Table 14 Roles and responsibilities summary

Responsible party **(Note: titles are likely to change)**	**Roles and responsibilities**
Civil design manager	Includes relevant environmental controls into the detailed design Provides guidance to supervisors regarding implementation of the design Provides input into the planning of rehabilitation work
Site manager	Oversees supervisors' environmental activities
Clearing and grubbing supervisor	Plans methods and sequencing of clearing and grubbing with clearing contractor and fauna spotter-catcher Directs the implementation of environmental management measures with the environmental supervisor (e.g. erosion and sediment controls, clearing areas demarcation, dust control, etc.) Oversees clearing/grubbing activities and associated environmental measures, and reports on such activities to the site manager and environmental supervisor Implements corrective actions stemming from environmental incident investigations Ensures contractors and sub-contractors engaged are aware of their environmental responsibilities and competent to implement any relevant environmental measures
Pathway construction supervisor	Directs the implementation of environmental management measures with the environmental supervisor (e.g. erosion and sediment controls, dust control, etc.) Oversees pathway construction environmental activities and reports on such activities to the site manager and

Responsible party (Note: titles are likely to change)	Roles and responsibilities
	environmental supervisor Implements corrective actions stemming from environmental incident investigations Ensures contractors and sub-contractors engaged are aware of their environmental responsibilities and competent to implement any relevant environmental measures
Dragline transport/shut-down supervisor	Directs the implementation of environmental management measures with the environmental supervisor (e.g. fire prevention, spill controls, hazardous material management, etc.) Oversees dragline transport/shut-down environmental activities and reports on such activities to the site manager and environmental supervisor Implements corrective actions stemming from environmental incident investigations Ensures contractors and sub-contractors engaged are aware of their environmental responsibilities and competent to implement any relevant environmental measures
Rehabilitation supervisor	Directs and oversees the implementation of rehabilitation measures with the environmental supervisor Implements corrective actions stemming from environmental incident investigations Ensures contractors and sub-contractors engaged are aware of their environmental responsibilities and competent to implement rehabilitation works
Environmental supervisor	Undertakes inspections and monitoring or supervises others Liaises with other supervisors regarding environmental performance

Responsible party (Note: titles are likely to change)	Roles and responsibilities
	Undertakes incident investigations and determines corrective actions Keeps and maintains environmental records and environmental induction/training records
Fauna spotter-catcher	Implements activities related to fauna/breeding places in this CECP (pre-clear surveys, fauna relocation, etc.) Reports to the clearing and grubbing supervisor and environmental supervisor.

5.2.6 Competency and training

The CECP will contain the following minimum competency and training requirements.

To ensure all relevant site personnel are aware of, and trained in, the environmental requirements of the Project, personnel is required to undergo a project specific Health Safety and Environment (HSE) induction.

The induction will include the following components:

- Adherence to HSE legislative requirements and environmental policies, including the potential consequences of not meeting environmental responsibilities
- Site access requirements
- Organisational structure, roles and responsibilities and communication protocols
- Erosion and sediment control
- Protection of water quality
- Amenity (including noise and light management)
- Flora and fauna management (including interaction with fauna, particularly MNES species)
- Equipment hygiene requirements
- Cultural heritage management
- Waste management
- Hazardous materials management
- Spill management and response, including spill kit types and locations
- Incident management
- Crisis and emergency management.

Appointed contractors, sub-contractors, consultants and operators are required to ensure all personnel have attended the project specific HSE induction before the commencement of works. Designated personnel must also be familiar with, and sufficiently trained in the environmental controls required by this EMP relevant to their scope of work. Personnel and contractors engaged to carry out specific environmental management activities (e.g. fauna spotting and catching, erosion and sediment control planning and implementation, vegetation planting, etc.) are required to have the appropriate qualifications for their activities.

Regular induction refresher training will be delivered in toolbox talk sessions on environmental related information. Environmental awareness topics will be included in toolbox sessions and various other Project meetings. Visitors will also be required to attend a visitor induction prior to entry into the Project site.

Training records will be maintained, including names of personnel who have received the training, the date of the training, the name of the trainer and the theme of the training. Records of inductions and other environmental awareness training provided will be held by the health and safety supervisor and/or environmental supervisor.

5.2.7 Emergency contacts and procedures

The CECP will list environmental emergency contacts and procedures. These will be determined closer to commencement of execution when site responsibilities between BMC and various contractors have been established.

5.2.8 Risk assessment

The CECP will include a project environmental risk assessment, aligned with that presented in Table 18 below, updated to reflect the current Project information. The Table provides a summary of the risk assessment of each potential impact identified to MNES flora and fauna relevant to the Project. The risk assessment was undertaken using the risk likelihood and consequence measure tables (Table 15 and Table 16) and the risk severity rating matrix at Table 17.

Table 15 Risk likelihood matrix

Qualitative measure of likelihood	
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the Project
Possible	Might occur during the life of the Project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances

Table 16 Risk consequence matrix

Qualitative measure of consequences	
Minor	Minor incident of environmental damage that can be reversed
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts
High	Substantial instances of environmental damage that could be reversed with intensive efforts
Major	Major loss of environmental amenity and real danger of continuing
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage

Table 17 Risk severity matrix

	Consequence				
	Minor	**Moderate**	**High**	**Major**	**Critical**
Highly likely	Medium	High	High	Severe	Severe
Likely	Low	Medium	High	High	Severe
Possible	Low	Medium	Medium	High	Severe
Unlikely	Low	Low	Medium	High	High
Rare	Low	Low	Low	Medium	High

Table 18 Project risks assessment – flora and fauna

Potential impact	Risk likelihood	Risk consequence	Risk severity
Accidental non-compliance with clearing boundaries leading to excessive (unauthorised) vegetation clearing, including MNES habitat	Likely	Moderate	Medium
Clearing activities causing accidental harm to fauna	Likely	Moderate	Medium
Vehicle traffic causing harm to fauna from strike	Possible	Moderate	Medium
Deep excavations leading to trapping and injury/death of fauna	Possible	Moderate	Medium
Soil disturbance causing erosion, leading to impact to vegetation	Possible	Moderate	Medium
Earthworks causing excessive dust emissions and affecting plant photosynthesis	Likely	Minor	Low
Fuel/chemical spill causing impact to vegetation	Unlikely	Minor	Low
Project-generated bushfire causing loss of vegetation and fauna/fauna habitat	Rare	Major	Medium
Night lighting causing disturbance to fauna	Likely	Minor	Low

5.2.9 Management measures – flora and fauna

The CECP will detail management measures for MNES, consistent with those outlined in sections below. It should be noted that the approach adopted is activity-based. This removes the need to state the Project stage to which the management measures apply as suggested by DoEE's *Environmental Management Plan Guidelines*. This approach is best suited to this Project as there will not be distinct construction and operational phases, as the clearing and grubbing, pathway construction, move operations and rehabilitation activities will be carried out in sequence along the route and therefore mostly concomitantly.

5.2.9.1 Flora and fauna context

MNES

The following four EPBC Act threatened fauna species are considered likely or to have potential to occur at the Protect site, where suitable habitat was found:

- Squatter Pigeon *Geophaps scripta* (Vulnerable)
- Ornamental Snake *Denisonia maculata* (Vulnerable)
- Koala *Phascolarctos cinereus* (Vulnerable)
- Yakka Skink *Egernia rugosa* (Vulnerable).

Seven patches of Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC were located on site.

Brigalow TEC vegetation and habitat of the above fauna species located within the dragline move corridor will need to the cleared. This clearing must be within the approved disturbance limits and kept to the minimum necessary.

A purpose-built Project GIS database will be established for the locations of the above species' habitat and Brigalow TEC patches and relevant maps will be issued as necessary to relevant site personnel (refer section 5.2.10).

Three migratory fauna are considered to be likely or potential to occur:

- White-throated Needletail *Hirundapus caudacutus*
- Fork-tailed Swift *Apus pacificus*
- Oriental Cuckoo *Cuculus optatus*.

Harm to fauna must be avoided to the greatest extent possible.

5.2.9.2 Flora and fauna management measures

Objectives and performance criteria are outlined below. Table 19 describes the environmental management measures applicable to flora and fauna. The management measures reflect the provisions of the latest version of the Species Management Program required at State level.

Objective	To minimise impacts on flora and fauna from the Project with a particular focus on EPBC Act listed Ornamental Snake, Yakka Skink, Squatter Pigeon and Koala
Performance criteria	▪ No accidental clearing beyond designated footprint areas ▪ All encountered Ornamental Snake, Squatter Pigeon and Koala are successfully avoided and/or relocated so as to minimise harm ▪ No importation and spread of new weed species into the Project footprint ▪ No generation of bushfires from works ▪ No introduction of pest animals to the Project area.

Table 19 flora and fauna management measures

FLORA AND FAUNA Activities	Management measures
Planning/design of clearing and grubbing	Compile and upkeep a GIS database including all areas of MNES fauna habitat and Brigalow TEC patches. The database is available to all personnel and contractors involved in the clearing activities planning and execution. At least 24 hours prior to commencement of clearing and grubbing activities in remnant vegetation and/or areas of risk, pre-clear fauna surveys in areas of ground-truthed remnant vegetation must be undertaken by appropriately qualified and experienced personnel to check for animal breeding places and any resident fauna. Particular attention will be paid to the following habitat features: ▪ Fallen timber and burrows, including rabbit burrows that may support Yakka Skink colonies. ▪ Areas of cracking clay soils that may support Ornamental Snakes ▪ Squatter Pigeon nests ▪ Short-beaked echidna burrows ▪ Any other fauna nest/habitat. Following the pre-clear survey, clearing operations and methods will be discussed between the fauna spotter-catcher, clearing supervisor and clearing contractor to ensure there is no unnecessary disturbance to animal breeding places and associated fauna. The clearing contractor personnel must be specially trained on identification of clearing limits, their delineation and the consequences of not complying with limits. Clearing/grubbing activities sequencing and methodology will be planned by the clearing/grubbing supervisor, the clearing contractor and the fauna spotter-catcher in accordance with measures on

FLORA AND FAUNA Activities	Management measures
	fauna/breeding places management in this CECP, in order to optimise efficiency of fauna protection and clearing activities (e.g. methods to unearth Yakka Skink colonies or retrieve sheltering Ornamental Snakes from soil cracks). Plan and design erosion and sediment control measures required in work areas as part of the detailed design and works planning, in collaboration with the clearing and grubbing contractor.
Clearing and grubbing	Prior to the commencement of clearing/grubbing activities within each section of the alignment to be cleared, a pre-start meeting will be arranged by the clearing supervisor to clearly define roles and the approach to fauna and animal breeding place management, in collaboration with the fauna spotter-catcher. Remnant vegetation and habitats where no clearing can occur that are adjoining the clearing areas must be progressively demarcated ahead of clearing crews (e.g. fencing, flagging tape or traffic cones or other delineation). Where ground does not need to be levelled, retain rootball of removed vegetation in ground to avoid soil disturbance and erosion. All cleared vegetation and grubbed soil must be stockpiled in designated areas for respread during rehabilitation. Clearing activities must be carried out in accordance with the Project Vegetation Clearing Procedure (Appendix I)

FLORA AND FAUNA Activities	Management measures

Fauna/breeding places management

An appropriately qualified and experienced fauna spotter-catcher must be present during clearing of ground-truthed remnant vegetation areas with a specific focus on animal breeding places and other habitat features flagged during the pre-clear surveys.

Typically, undergrowth and shrubs are to be cleared first, with any hollow-bearing trees and other known or potential breeding places then left overnight (i.e. once the understorey is removed) to allow any resident animals an opportunity to self-relocate.

Clear vegetation in a sequential manner to encourage fauna to move out of the proposed development area and into adjacent bushland.

Where any breeding places are found to contain animals or eggs:

- Delay the removal of the feature and surrounding habitat until such time that the breeding activity has been completed.
- If not feasible, relocate the breeding place with the animal(s)/eggs to the nearest suitable habitat outside the clearing footprint (e.g. plugging/ blocking the entrance/exit holes of hollows and relocating the section of the tree which contains the animal using an excavator with a grab).
- If is not feasible, adult animals and non-dependent young will be relocated to the nearest suitable habitat outside the clearing footprint, while eggs and/or dependant young will be taken to an authorised wildlife carer to attempt rehabilitation (if feasible) or euthanised.

Only a suitably qualified fauna spotter-catcher will handle fauna and fauna nests, assist fauna to relocate and care for injured or orphaned wildlife

FLORA AND FAUNA Activities	Management measures
	Animals within nest or tree hollows will be captured using an elevated work platform or by lowering the tree to the ground as smoothly and slowly as possible to minimise injury to animals and damage to breeding places (e.g. using a feller buncher, rotating tree grab or bucket). Animals returned to the wild will be released as soon as possible in accordance with the specific needs of the individual animal (e.g. nocturnal released at the end of the day). Animals will be released into suitable, nearby habitat to be retained (i.e. areas with shelter and microhabitat conditions as close as possible to the habitat of capture). Habitat features such as tree hollows and logs will be relocated into adjacent habitat to provide ongoing resources for relocated fauna wherever possible. When relocating a hollow, efforts will be made to place it in a similar position from which it was removed, i.e. at the same height (where practicable) and facing in the same direction. Removed nests will be relocated immediately and nearby. The fauna spotter-catcher will monitor the nest to ensure parent birds are feeding and protecting any nestlings. Where chicks or fledglings are visible or audible, the possibility of avoiding the tree until the fledglings are mobile and can move on their own will be considered. Animals is retained for > 1 hour will be checked regularly (i.e. a minimum of every two hours) and the following requirements/actions will be followed: ▪ Suitable sized housing with appropriate respite and hide space (e.g. move cages, box traps, cloth bags) ▪ The animal must be concealed within its housing. In most cases the standard holding cages provide suitable protection when a towel or blanket covers the animal housing ▪ Housing must be clean, hygienic, and safe

FLORA AND FAUNA Activities	Management measures
	▪ Keep away from other confined animals that may be its natural predators in the wild ▪ Provide suitable environmental conditions and, if required, heating or cooling to assist in thermoregulation ▪ Must allow ample airflow and be protected from direct sunlight ▪ Place in a safe location away from other animals, noise, dust, moving equipment, loud machinery ▪ Provide with water ▪ All personnel within the area must be aware of the animal and its requirements. The following measures will be applied for captured orphaned or juvenile wildlife: ▪ Arboreal mammals: If animal is fully furred, attempt to reunite with parent. If not able to reunite, or animal is too young to climb, it will be taken to a registered carer. ▪ Juvenile birds: if parents are in immediate vicinity, place nest or suitable alternative as high as possible in a nearby tree, move any equipment out of the area and monitor to see if parents return to feed juveniles. If not practical, if juvenile birds do not have feathers, or parents do not return, the birds will be taken to a registered carer. ▪ Ground mammals are usually impracticable to re-unite and will likely be taken to a registered carer. ▪ All animals must be placed in care within 24 hours, preferably within 12 hours. The following measures will be applied for injured wildlife: ▪ If an animal has severe injuries (e.g. missing body parts or major crush injuries), it will be euthanised immediately using an appropriate method that ensures a quick, painless death. ▪ All pouched animals are to be checked for young before euthanising. ▪ If the fauna spotter-catcher determines that the animal is unable to be euthanised effectively in

FLORA AND FAUNA Activities	Management measures
	the field, or the injuries sustained may not cause excessive suffering that warrants immediate euthanasia, the injured animal is to be removed from the work site and examined by a vet. ▪ All injured animals will be provided with medical attention within 4 hours of an incident occurring, preferably within 1 hour. The fauna spotter-catcher should exercise judgement on the immediacy of treatment based on level of injury/pain. ▪ The fauna spotter-catcher is to advise the clearing supervisor when leaving the site to take an animal to a vet, and confirm what work can be done in their absence or provide strict instructions to a third party taking the animal for veterinary assessment. ▪ If necessary, the fauna spotter-catcher or a person under their instruction is to pick up the animal from the vet following treatment and arrange for a registered carer to attempt rehabilitation.
All ground disturbance activities	Water disturbed unsealed areas to reduce dust emissions in accordance with measures in the air quality section of this CECP. Install erosion and sediment control measures appropriate to the works carried out, soil type, topography and weather forecast, in accordance with *Best Practice Erosion and Sediment Control*[2]. Follow any design produced as part of the detailed design and works planning phase.
Excavations	Deep pits and trenches must be fenced to avoid trapping fauna. Pits and trenches deeper than 0.5m must be monitored each day to locate and remove any trapped fauna.

[2] IECA 2008, *Best Practice Erosion and Sediment Control*. International Erosion Control Association (Australasia), Picton NSW.

FLORA AND FAUNA Activities	Management measures
Access to site by vehicle, plant or import of goods - biosecurity	All vehicles and plant must be washed at existing washdown facilities and certified as free of weeds prior to arrival to site. Vehicle and plant equipment that has undertaken activities in confirmed weed infestation areas must be washed down, vacuumed or air blown and weed free certified upon exiting the area. Only approved plant species and seeds must be brought onto site for rehabilitation (for seed species, refer the Transport & Civil Works Technical Specification H351924-00000-220-242-0001 (Hatch)) If imported materials are found to be contaminated at the site of unpacking then they must be removed and taken off site to a licensed facility for cleaning or disposal. No animals must be brought to site by personnel or contractors, including domestic cats and dogs and other potential pests.
Operation of vehicles	Implement vehicle speed limits on site to 40km/h during daytime and 30km/h at night time to avoid fauna strike. Vehicles and equipment must remain on marked roads and tracks or stay within the Project corridor boundaries.
Operation and maintenance of vehicles and plant,	Equipment must be checked for leaks prior to commencing works. Fuel, oils and chemical must be stored in covered and bunded areas or vehicles.

FLORA AND FAUNA Activities	Management measures
refuelling	Fuel, oils and chemical spills will be cleaned up immediately and the contaminated material transported to a licensed disposal facility.
All activities – bushfire prevention	Weather conditions and local weather news will be monitored daily to understand the fire danger rating. Clear communication lines and responsibilities must be established for contacting the local Rural Fire Service. Personnel must be trained in basic fire-fighting techniques with the fire-fighting equipment supplied. Works involving ignition sources (e.g. welders, torches, hot machinery) must be restricted to fire-safe areas equipped with fire-fighting equipment. Smoking is restricted to defined designated fire-safe smoking areas. Hazardous and flammable substances must be stored in fire-safe areas in accordance with *AS 1940 - Storage and Handling of Flammable and Combustible Liquids*. Lighting of fires is prohibited. Fire-fighting equipment (e.g. portable fire extinguishers) must be stored in plant, vehicles and at site offices. Water carts must be present and used on site.

FLORA AND FAUNA Activities	Management measures
Dragline transport	Retain and maintain all flagging tape and fencing demarcating vegetation clearing limits until rehabilitation works commence. Maintain erosion and sedimentation controls.
Lighting at night	Lighting at night will only be used in rare occasions (e.g. road crossings). Lighting shields will be installed and motion detection lighting is utilised where practical.
Rehabilitation	Rehabilitate disturbed areas post completion of the Project in accordance with the Project Rehabilitation Management Plan.
Monitoring and reporting	The fauna spotter-catcher will prepare an animal breeding places register to record all animal breeding places known or suspected to have been tampered with (including destroyed) during clearing and grubbing activities. The register will be provided to the Department of Environment and Heritage Protection (DEHP) within 6 months of the interactions with the species[3] deemed at high risk of impacts.

[3] Squatter Pigeon (southern sub-species) *Geophaps scripta scripta* (vulnerable), Ornamental Snake *Denisonia maculate* (vulnerable), Koala *Phascolarctos cinereus* (vulnerable), Yakka Skink *Egernia rugosa* (vulnerable), Death Adder *Acanthophis antarcticus* (vulnerable), Shortbeaked Echidna *Tachyglossus aculeatus*, Fork-tailed Swift *Apus pacificus*, White-throated Needletail *Hirundapus caudacutus*, Great Egret *Ardea modesta*, Oriental Cuckoo *Cuculus optatus*

FLORA AND FAUNA Activities	Management measures
	The fauna spotter-catcher must report to the relevant supervisor (mainly clearing and grubbing supervisor) and to the environmental supervisor. All deaths or injuries to native fauna species will be immediately reported to the clearing supervisor, or as soon as practical, after the incident has occurred. Vegetation clearing activities must be monitored daily by an environmental supervisor. Erosion and sediment control measure must be monitored on a daily basis in active construction areas and on a weekly basis in non-active areas. The ecologists in charge of the pre-clear surveys will document the surveys in a stand-alone report, which includes mapping of all identified animal breeding places, a statement to justify the suitability and qualifications of the person(s) that undertook the surveys, and a statement justifying the timing of the survey, with details of any limitations and assumptions associated with the timing of the survey. The environmental supervisor carries out site monitoring and reports on findings to the relevant supervisor and/or site manager. Non-conformances must be reported on the same day.

5.2.10 Environmental management maps and diagrams

The CECP will contain and/or refer to environmental maps and diagrams for specific areas to illustrate planned environmental controls in specific locations. These maps and diagrams may be produced during detailed design or as part of detailed work activities planning for specific areas (e.g. watercourses, MNES flora areas and fauna habitat). It is also anticipated that GIS data will be compiled for use on electronic devices (e.g. GPS, tablets, etc.) by personnel while on site.

5.2.11 Environmental monitoring

The CECP will contain a description of monitoring activities consistent with the following text.

Monitoring specific to environmental aspects is described under each aspect in section 5.2.9. Authorised personnel, suitable qualified or trained, will perform monitoring during Project execution.

Other monitoring will be carried out by the environmental supervisor and will involve environmental data review completed on a monthly basis to identify trends in environmental performance and to assess and identify opportunities for improvement. This will include monitoring of environmental incidents types and number, and progress and effectiveness of associated corrective actions.

All environmental monitoring documentation generated on the Project, whether hard copy or electronically generated, will be controlled in accordance with the Project document control processes. Records will be kept to demonstrate compliance with the CECP, environmental approval conditions and other identified legal obligations.

Continuous improvement

The results of the monitoring will be used as management indicators of the effectiveness of environmental controls. An adaptive management approach will be implemented by the Project, and management measures detailed within the CECP will be improved in light of monitoring results.

5.2.12 Corrective actions

The CECP will detail provisions regarding corrective actions management. These provisions will be consistent with the following text, refined to reflect progression of the Project planning.

The objective of an investigation is to establish the root cause(s) and contributing factors of an environmental incident and to raise and close out corrective actions to prevent recurrence. The investigation process, including the development of recommended corrective actions, is the responsibility of the relevant supervisor as incident owner, with the support of the environmental supervisor (and an assigned investigation team, where applicable). The incident owner and environmental supervisor are responsible for approving the investigation and ensuring that all corrective actions are appropriate, set close out dates and track corrective actions to completion.

Dependent on the level of the investigation required, the process can follow the following basic stages:

- Plan the investigation process
- Collect evidence (physical, statements, photographs, etc.)
- Collate and cross check information
- Determine sequence of events through use of a snap chart
- Define causal factors
- Analyse each causal factor's root cause
- Identify generic causes
- Develop corrective actions to address root cause(s) and assign responsibilities and deadlines for completion of corrective actions
- Ensure all corrective actions are managed and tracked to completion.

When a complaint alleging environmental breach or nuisance is received (through a regulator or directly), it will be investigated the same way as an incident. Where relevant, the regulator will be advised of the measures proposed to be implemented. Complaints must be resolved using appropriate dispute resolution techniques and to the regulator's satisfaction, where relevant.

5.2.13 Environmental auditing

The CECP will define provisions regarding environmental auditing. These provisions will be consistent with the following text, refined to reflect progression of the Project planning.

Environmental audits will be undertaken in order to measure the environment performance and compliance of the Project against legal obligations, conditions of approvals, and actions outlined in the CECP and associated documents.

Compliance audits against the CECP and development approval conditions will be conducted following any major environmental incident.

At least two internal and one external independent audit will be conducted by suitably qualified environmental personnel.

5.2.14 Reporting

The CECP will address reporting matters as follows.

Reporting activities specific to monitoring for each environmental aspect are described in 5.2.9, which describes environmental management measures. This section describes the periodic reporting that will occur during the execution of the Project.

The following reporting requirements apply during the execution of the Project:

The clearing and grubbing contractor must provide an activity summary to the clearing and grubbing supervisor at least twice weekly, including the extents of areas cleared in reference to mapped clearing limits.

A weekly report on environmental matters (prepared under the oversight of the environmental supervisor) will be provided to the site manager, including a summary of site observations, incidents and corrective actions and monitoring results.

Reporting to regulators will be undertaken as required under approval conditions and upon request.

All personnel must report incidents immediately to the relevant supervisor and environmental supervisor.

5.2.15 EMP review

The CECP will include the following provisions regarding its review.

To ensure the continuing suitability, adequacy and effectiveness of this CECP, its content and on-site implementation will be reviewed as part of incident investigations and the implementation of corrective actions.

The CECP review team will be led by the environmental supervisor in collaboration with the site manager and any other relevant party.

The CECP must not be amended in a way that would contravene or create inconsistency with any condition of approval or other legal requirement.

6 Proposed Offsets

BMC proposes direct offsets to address impacts that cannot be avoided or mitigated. The offset consists of 346.3 ha of habitat offset. It is located on a property known as "Croydon Station" located within the Brigalow Belt bioregion, which experiences similar habitat and climatic conditions as the impact site. "Croydon Station" (Lot 9 BH194) is situated 90km to the south-east of the Project. It contains patches of Brigalow TEC vegetation already established and substantial areas of brigalow regrowth with gilgai relief. These areas have been targeted to supply the offset for the Project. A 113.7ha area of Brigalow (27.1ha remnant and 86.6ha regrowth) has been selected as it contains the core habitat requirements for the Ornamental Snake and Yakka Skink, abuts a regional corridor that encompasses the Connors River, and will rehabilitate/regenerate to habitat that will satisfy the Project's offset requirements.

Additionally, a 162.2ha area of eucalypt woodland that adjoins the Connors River has been identified adjacent to the Ornamental Snake offset area to satisfy requirements for the Project impacts to Queensland MSES. This MSES area will add further value to the MNES offset as it acts as a buffer area. It will also deliver further benefits to the MNES species, as the habitat provided in this buffer area is similar to the habitat requirements of the MNES species.

Field verification studies of the property undertaken in March/April 2016 noted that the presence of habitat suitable for the impacted species is co-located with the Brigalow TEC due to the presence of deep cracking soils and gilgai. The presence of the Ornamental Snake and Squatter Pigeon were both verified at that time.

The Offset Delivery Plan for MNES is attached at Appendix F and the Offset Area Management Plan Croydon Station is attached at Appendix G.

As explained in section 4.2.2, the proponent anticipates that the actual clearing will be less than what is sought to be approved. Consequently, actual offset requirements are also likely to be less than what will be proposed in the Offset Delivery Plan for MNES. Should this be the case, a revised Offset Delivery Plan would be proposed.

7 Economic and Social Matters

7.1 Cost and benefit of the action compared to other options

A similar dragline was moved along the proposed path in 2000. This move was completed successfully without incident, and on time and budget. Reusing this same path represents the lowest risk to BMC. BMC did however consider alternative routes. A key constraint to the move is steep gradients. The dragline is unable to move across terrain that exceeds approximately 10% gradient.

The Carborough Range extends north-south in between GRM and SWC. BMC therefore considered alternative routes to the north and further south of the Carborough Range.

These alternative routes had serious disadvantages relative to the preferred option and were ruled out for the following reasons:

- All routes required more extensive vegetation clearing - the selected route capitalises on using the 2000 dragline move corridor as much as is practicable, as this corridor was cleared of vegetation at the time
- All alternative routes are longer, and therefore involved more land disturbance and greater costs
- The alternative routes offer no significant advantage in reducing the number of interactions with key infrastructure such as rail, powerlines and roads.

Dismantling the dragline and transporting the parts via Red Hill Road, Goonyella Access Road, Moranbah Access Road and Peak Downs Highway was considered. However, this alternative involves significantly higher costs and has a longer schedule to complete. This alternative also introduced a number of safety risks for employees working to assemble and disassemble the dragline, and for the transporter and public due to increased traffic along the Peak Downs highway.

7.2 Potential employment opportunities

The Project will help sustain operations at SWC by lowering mining costs. As SWC progresses, the cost of mining increases as the coal becomes deeper for open cut mining. The dragline is able to move material at a lower unit cost than the existing methods and hence helps maintain SWC's competitiveness. SWC has an operational workforce in excess of 500 workers.

Up to 30 workers will be employed to execute the Project. These workers will be required for the duration of the move, with some jobs extending into the rehabilitation phase. It is anticipated that it will take approximately three months to complete the move of the dragline subject to weather conditions and constraints associated with infrastructure crossings.

This targeted productivity improvement arises as part of the broader productivity strategy being undertaken by BHP Billiton and BMC. This strategy is based on a BHP Billiton commitment to

maximise the social and economic benefits of our operations, contribute to economic development and minimise our environmental footprint through innovation, productivity and technology. This productivity focus is particularly important in the context of challenges associated with global markets experiencing economic uncertainty, extreme volatility and geopolitical instability[4].

The BHP Billiton Local Buying Program (the Program) is a targeted program providing opportunities for small businesses, with less than 25 full-time employees, to competitively supply goods and services to BHP Billiton – Mt Arthur Coal in New South Wales or BHP Billiton Mitsubishi Alliance (BMA) / BMC operations in Queensland. The Program targets businesses registered or operating with a primary place of business in the local government areas surrounding these operations along the east coast of Australia. In Queensland, the local government areas are Central Highlands, Isaac and Mackay Regions and in New South Wales the local government areas are Muswellbrook, Singleton and Upper Hunter Shires. All communities located in these areas are eligible to apply.

C-Res (a cost neutral entity) was established in 2012 to deliver the original BMA Local Buying Program and now delivers the Program for all BHP Billiton Australian Coal assets[5].

The Program increases opportunities for local, small to medium businesses to provide goods and services to BMA's seven and BMC's two metallurgical coal mines (including South Walker Creek) in the Bowen Basin and Hay Point Coal Terminal in Mackay.

Since the Program's inception in 2012, more than $90 million in work opportunities have been awarded to participating businesses in the Central Highlands, Isaac and Mackay regions. More than $26.64 million was awarded in financial year 2016.

BHP Billiton spent more than $11 million through the Program in the above regions during the first quarter of financial year 2017 (1 July – 30 September), setting a new quarterly record. The implementation of new projects, such as the dragline move, will make a contribution to sustaining or increasing the quarterly expenditure delivered via the Program.

7.3 Stakeholder consultation activities

Since March 2016, BMC has held numerous information and feedback meetings, and exchanged related correspondence, with the individuals and entities that need to provide some form of consent prior to the execution of the Project. These ongoing meetings have identified, explored and progressively addressed all issues and requirements raised by relevant guidance material and by the stakeholders. The aim of the engagements has been to resolve all issues so that the necessary consents can be secured prior to the Project execution during 2017.

At State and local Government level, the Project triggers the needs for consultation in relation to the following regulatory approvals under Queensland legislation:

[4] Refer p11 of 2016 Annual Report (http://www.bhpbilliton.com/~/media/bhp/documents/investors/annual-reports/2016)
[5] Refer to https://c-res.com.au/ and https://c-res.com.au/wp-content/uploads/2016/10/Qld-Regional-Business-Opportunties-Growing-as-BHP-Billiton-Local-Buying-Progam-Sets-New-Records-21-Oct-2016-.pdf

- Operational Work approval under the SP Act, including:
  - Operational work under the Isaac Regional Council planning scheme
  - Native vegetation Clearing
  - Work near and over railway corridors
  - Work near and over road corridors
  - Work in powerline corridors
- Protected Plant Clearing permit under the *Nature Conservation Act 1992* (NC Act)
- Permit to tamper with animal breeding places under the NC Act
- Quarry material sales permit under the *Forestry Act 1959*
- Road Corridor Permit and Traffic Control Permit under the *Transport Infrastructure Act 1994*.

In the interest of ensuring the most diligent and effective approval applications assessment process, the following has been undertaken:

- Pre-lodgement meetings (e.g. meeting held with representatives of the Isaac Regional Council and multiple State agencies in Mackay on 12 August 2016) and ongoing liaison with each relevant assessment agency and infrastructure owner in order to prevent gaps in applications' supporting information and errors in the statutory process
- Agreeing with regulatory agencies on assessment timeframes that are suitable for delivery of the Project's approvals in time for the planned commencement of the move
- Working collaboratively with regulatory agencies in order to promptly provide any additional information required or address any outstanding issue.

Similarly, in the interest of ensuring the most diligent and effective agreement development and execution process, the following has been undertaken:

- Site inspection meetings and ongoing liaison with each landowner in order to prevent conflicts in the Project and landholder activities, and identify gaps, errors and/or suitable amendments to the draft plans, designs and supporting information prepared by BMC for the purpose of the Dragline Move
- Agreeing with landholders on timeframes that are suitable for delivery of the necessary agreements in time for the planned commencement of the move
- Working collaboratively with landholders in order to promptly provide any additional information required or address any outstanding issue.

All consents are on track to be in place prior to the execution phase of the Project.

The key stakeholders, along with a high level description of the relevant consent being secured are as summarised in Table 20.

Table 20 Summary of stakeholder consents

Consulted Stakeholders	Summary of Targeted Consent Outcome
Eleven property owners including Queensland Rail and two mining companies other than BMC (refer section 1, table 1 of the Referral)	Land Access agreements.
Aboriginal people with Cultural Heritage interests in the locality of the dragline move route	BHP Billiton has been proactive in its engagement with relevant indigenous groups. BHP Billiton's engagement consistent with the intent of the *Engage Early*[6] guideline, which provides guidance for proponents on best practice Indigenous engagement for environmental assessments under the EPBC Act. Field checks, consultation and related documentation is being completed during 2016 and early 2017 as per the duty of care requirements of the Aboriginal Cultural Heritage Act 2003. Aboriginal parties, Barada Barna represented by WINNAA Pty Ltd is undertaking a cultural heritage survey across the Project activity footprint. BMC will work in accordance with our Cultural Heritage Management agreements to ensure Indigenous values are managed in an appropriate way.
Isaac Regional Council*	Assessment manager for the SP Act development application lodged in November 2016 (application number: PA16024) and expected to be decided in early 2017. The application is for a development permit for operational works that is excavation and filling and vegetation clearing.
Five Queensland Government concurrence and advice agencies for the SP Act development application and agencies administering legislation such as the NC Act*	Various permits and approvals from the following agencies: ▪ Department of Infrastructure Local Government and Planning (DILGP) ▪ Department of Environmental and Heritage Protection ▪ Department of Natural Resources and Mines ▪ DTMR

[6] Department of the Environment, *Engage Early - Guidance for proponents on best practice Indigenous engagement for environmental assessments under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*, February 2016.

Consulted Stakeholders	Summary of Targeted Consent Outcome
	▪ Department of Agriculture Forestry and Fisheries
Infrastructure Owners	Infrastructure crossing agreements being private arrangements, they require different approaches to regulatory approvals. As at December 2016, commercial contracts with infrastructure owners are near finalisation. The current advice received from power utility companies Powerlink and Ergon Energy and rail operator Aurizon is that the crossing commercial agreements with BMC will suitably address all aspects of the works.

***Note:**
Assessment under the SP Act and associated Integrated Development Assessment System (IDAS) process:

- Isaac Regional Council is the Assessment Manager in application of the SP Regulation Schedule 6, Table 1, item 1
- The State Assessment and Referral Agency (SARA) – a section of DILGP is the concurrence agency for all State matters, except works in power easements, for which power entities will be advice agencies to Isaac Regional Council.

As part of its assessment, SARA will seek advice from technical advice agencies including the Queensland Department of Natural Resources and Mines and DTMR.

Approval processes under other acts not integrated into the IDAS including:

- NC Act – process administered by DEHP
- Transport Infrastructure Act 1994 – process administered by DTMR.

In relation to road users, it is important to note that the Project's generation of additional traffic on the nearby road network will be negligible. Traffic at the Peak Downs Highway crossings will be managed in accordance with DTMR's specifications and a Traffic Control Permit.

Supporting information required as part of the planned early 2017 application for the Traffic Control Permit will include details of appointed traffic controller Traffic control plan drawings, Traffic management plan prepared in accordance with the Manual of Uniform Traffic Control Devices (DTMR).

The stakeholder engagement activities described above, along with the public notifications about the Project in accordance with the EPBC Act, comprise the consultation that has or is likely to occur.

8 Ecologically Sustainable Development

The Project incorporates a range of processes to achieve and promote the five principles of ecologically sustainable development. These are discussed below.

Decision-making processes should effectively integrate both long and short-term economic, environmental, social and equitable considerations

Both long and short-term economic, environmental and equitable considerations have been integrated into decision-making processes for the Project. The Project will have no or very limited social implications.

Short-term economic considerations lead to the decision to move the dragline on transporters as opposed to dismantling it and transporting it by road. Dismantling the dragline and road transport was found to be significantly more expensive.

Long-term economic considerations lead to the decision to move the dragline to SWC, where it will be used in a more cost-effective way than at GRM.

Environmental considerations have been, and will continue to be, an integral part of Project planning, design and implementation, as follows:

- A strong focus was placed on avoiding environmental impacts through:
  - Mostly reusing a corridor previously cleared in 2000 for a similar dragline move between the two same mines, thereby minimising vegetation clearing
  - Optimisation of the move route corridor using ecological field survey information to avoid areas and species of environmental significance, including TECs and threatened species habitat
- Proposed rehabilitation measures are aimed at reestablishment of existing vegetation that is proposed to be cleared of the long-term
- Offsets for impacts to MNES (and MSES) are proposed and will achieve a net increase in areas of MNES (and MSES) being protected over the long-term.

If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation

The ecological impacts of the Project were assessed thoroughly via a comprehensive ecological assessment and no threats of serious or irreversible environmental damage were identified.

Field surveys have been undertaken to understand the environmental values within the area and inform decision-making processes for the Project. The avoidance of impacts to MNES was a major driver in the identification and design of the current move route.

The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations

Due to its temporary nature, the Project will not cause irreversible environmental impacts. Following rehabilitation of the corridor, the health, diversity and productivity of the local environment is expected to return to its current state overtime.

Additionally, BMC is committed to providing biodiversity offsets that meet the requirements of the EPBC Act *Environmental Offsets Policy (October 2012)*. These offsets will deliver a conservation outcome that will maintain or improve the viability of MNES impacted by the Project. The areas used to offset relevant impacts will be managed and protected in perpetuity to ensure the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making

The conservation of biological diversity and ecological integrity has been fundamental in decision-making for the Project. This is most notably demonstrated by the reuse of the corridor used in 2000 and optimisation of the proposed corridor in order to avoid impacts to MNES, including the Brigalow TEC and areas known to support potentially important populations of the Ornamental Snake and Yakka Skink.

Improved valuation, pricing and incentive mechanisms should be promoted

This Project is well aligned to this principle given that it is fundamentally about utilising, at SWC, an existing large capital equipment item (i.e. the dragline) that has reached the end of its useful life at GRM. The utilisation of the dragline, as opposed to ordering a new dragline, demonstrates that BMC is committed to suitably exploring the value of lower cost alternatives to the typical default position of purchasing and deploying new equipment.

9 Summary

BMC is proposing to move a dragline from GRM to SWC along a route approximately 77km in length.

The Project was referred to DoEE for assessment under the EPBC Act. The Project (EPBC 2016/7788) was declared a controlled action subject to assessment through Preliminary Documentation under the controlling provision for listed threatened species and communities (EPBC Act sections 18 and 18A).

The information provided in this documentation specifically addresses the further information request issued by DoEE on 18 November 2016. This report has provided a detailed impact assessment to key MNES considered as part of the Project.

Potential impacts of the Project have been addressed according to the hierarchy of avoid, mitigate and then offset.

The avoidance of impacts to MNES was a major driver in the identification and design of the dragline move corridor. Where impacts to MNES could not be further avoided, a range of mitigation and management measures have been proposed to reduce and manage these impacts. This report has outlined these measures in detail.

It is considered that the Project is likely to result in residual significant impacts to the following MNES after all measures to first avoid and then mitigate have been taken into account:

- The loss of 9.73ha of Brigalow TEC
- The loss of 105.63ha of habitat for Yakka Skink
- The loss of 52.44ha of habitat for Ornamental Snake.

Offsets are proposed for the above residual impacts in accordance with the *EPBC Act Environmental Offset Policy*.

Appendix A Dragline pathway formation typical design

Appendix B Typical design of watercourse crossing and Isaac River crossing

Appendix C Terrestrial Ecology MNES Assessment Addendum

Appendix D Rehabilitation Management Plan

Appendix E Terrestrial Ecology MNES Assessment

Appendix F Offset Delivery Plan for Matters of Environmental Significance

Appendix G Offset Area Management Plan Croydon Station

Appendix H Comparison maps of 2017 route and year 2000 route

Appendix I Vegetation Clearing Procedure