SARAJI EAST MINING LEASE PROJECT

Environmental Impact Statement

Appendix C-2Offset Strategy





Saraji East Mining Lease Project

Offset Strategy

Saraji East Mining Lease Project

Offset Strategy

Client: BM Alliance Coal Operations Pty Ltd

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Abbreviations

BMA BM Alliance Coal Operations Pty Ltd

BOP Biodiversity Offset Plans (in stages) that must be developed and approved by

regulators prior to commencement of mining. BMA proposed to submit one combined BOP for each stage of the Project to meet Sate and Commonwealth requirements.

CHPP Coal Handling Preparation Plant

DES Department of Environment and Science

DAWE Department of Agriculture, Water and Environment

EIS Environmental Impact Statement

EO Act Environmental Offsets Act 2014

EO Policy Environmental Offsets Policy 2017

EPBC Act Environment Protection and Biodiversity Conservation Act 1999

EVNT endangered, vulnerable and near threatened

FPC foliage projective cover

FY financial year

ha hectare

IRC Isaac Regional Council

km kilometre

LGA Local government area

MIA Mining infrastructure area

ML Mining Lease

MLA Mining lease application

MNES Matters of National Environmental Significance

MSES Matters of State Environmental Significance

Mtpa Million tonnes per annum

MW megawatt

NC Act Nature Conservation Act 1992

PMAV Property Map of Assessable Vegetation

RE regional ecosystem

ROM run of mine

SEMLP Saraji East Mining Lease Project

SLC special least concern

TEC threatened ecological community

UNESCO United Nations Educational, Scientific and Cultural Organisation

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Executive summary

Australian and Queensland Government policies require the provision of environmental offsets for significant residual impacts to Matters of National Environmental Significance (MNES) and Matters of State Environmental Significance (MSES).

This Offset Strategy describes how the BM Alliance Coal Operations Pty Ltd (BMA) will secure and manage offsets required to compensate for the significant residual impacts of the Project on MNES and MSES as determined by the Queensland *Environmental Offsets Act 2014* (EO Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Environmental Offset Policy (2012), and how offset obligations will be acquitted over the life of the Project.

The objective of this strategy is to outline BMA's proposed approach to the delivery of offsets as well as facilitate discussion between the Department of Agriculture, Water and Environment (DAWE) and the Queensland Government Department of Environment and Science (DES) on suitable offsets for unavoidable losses of biodiversity values incurred by the Project.

While committed to avoiding and minimising impacts to protected matters and the environment, BMA is seeking approval for up to 100 per cent disturbance of vegetation across the Project Footprint as a predicted maximum significant residual impact as a precaution due to the uncertainty regarding clearing works and design associated with incidental mine gas drainage and subsidence impacts from long-wall mining. Using maximum predicted significant residual impacts provides for a conservative assessment of potential impacts, while the final extent of disturbance is likely to be significantly less.

BMA has predicted the maximum significant residual impact of the Project on MNES and MSES and identified potential offset areas within the Brigalow Belt Bioregion for all the matters with significant residual impacts.

Through direct land-based offsets, BMA will secure proportional areas for residual impacts to each protected matter and deliver an overall conservation outcome that improves or maintains the viability of protected matters.

It is proposed that offset delivery is undertaken in a staged approach related the staging of Project construction and direct and indirect impacts. The staged approach allows offsets to be sought for the maximum area of significant residual impact for each stage, with reconciliation of actual impacts by field verification to be carried through into the following stages or for future BHP projects as offset credits. This approach provides an incentive to avoid and minimise impacts wherever practical.

Through this Offset Strategy, BMA demonstrates that the Project is committed to ensuring the efficient, effective, timely, transparent, proportionate, scientifically robust and reasonable use of offsets to deliver improved environmental outcomes under the EPBC Act EO Policy and Queensland EO Act. This offset strategy also provides guidance on the further development of offset requirements to be detailed in the offset management plan.

Prior to Stage 1, and associated direct construction impacts, the acquittal process to be used to demonstrate that offsets have been provided for existing and future significant residual impacts will be subject to discussion between the DAWE and the DES and subsequent landholder negotiations.

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DRAFT

1.0 Introduction

1.1 Purpose

The purpose of this Offset Strategy is to outline the offset requirements for the development of the Saraji East Mining Lease Project (the Project) under the Queensland *Environmental Offsets Act 2014* (EO Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The objective of the Offset Strategy is to outline BMA's proposed approach to deliver appropriate nature and scale of offsets to achieve compensatory environmental outcomes and facilitate discussion between the Department of Agriculture, Water and Environment (DAWE) and the Queensland Government Department of Environment and Science (DES) on suitable offsets for unavoidable losses of biodiversity values incurred by the Project.

Related assessment of matters subject to offset under the relevant legislative framework are covered with the Environmental Impact Statement (EIS) (BMA, 2021) prepared for the Project, specifically Chapter 6 Terrestrial Ecology, Chapter 21 Matters of National Environmental Significance and Appendix C-1 Terrestrial Ecology Technical Report (AECOM, 2020).

1.2 Project overview

The Project is located approximately 170 kilometres (km) south-west of Mackay and 30 km north of Dysart in the Isaac Region of central Queensland (Figure 1). This location is immediately east of the approved existing open-cut Saraji Mine (Section 1.2.1), which means that the extent and nature of the resource is well understood, of high quality and will meet current and expected future market requirements and demands.

The Project is a greenfield single-seam underground mine development to be located on Mining Lease Application (MLA) 70383 and MLA 70459 commencing from within Mining Lease (ML) 1775. The Project Site comprises Exploration Permit for Coal (EPC) 837, EPC 2103, MLA 70383, MLA 70459, ML 1775, ML 70142 and ML 1782, except the southern extent of the powerline connection that is within Lot 10 on CNS83 and Lot 11 on CNS373.

The Project Site encompasses approximately 11,427 hectares (ha) of predominantly grazing land. Mining and the infrastructure required to support the Project will be constrained to 3,425 ha; this is referred to as the Project Footprint. The Project Site and Project Footprint are presented on Figure 2.

Where practicable, the Project's infrastructure has been located to minimise the overall impact on environmental values through an iterative process of identifying environmental and operational constraints. The Project configuration was developed based on proximity to practical siting and sizing of coal handing and preparation plant (CHPP), proximity to rail loading infrastructure, future mining and minimising disturbance of environmentally sensitive areas.

The Project will preferentially use of the existing approved Saraji Mine infrastructure such as powerlines, water supply pipelines, CHPP, haul roads, workshops and warehouses. Additional mine infrastructure will include a new CHPP, associated mine infrastructure area (MIA) and a new rail spur and balloon loop located on the Project Site where it overlaps the existing adjacent Saraji Mine. A new infrastructure and transport corridor will be constructed on MLA 70383 and MLA 70459 to accommodate the reconfiguration of existing power and water networks and internal access roads.

A summary of the key Project stages including timing, associated mining activities and production is outlined in the Table 1.

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Table 1 Project timing summary

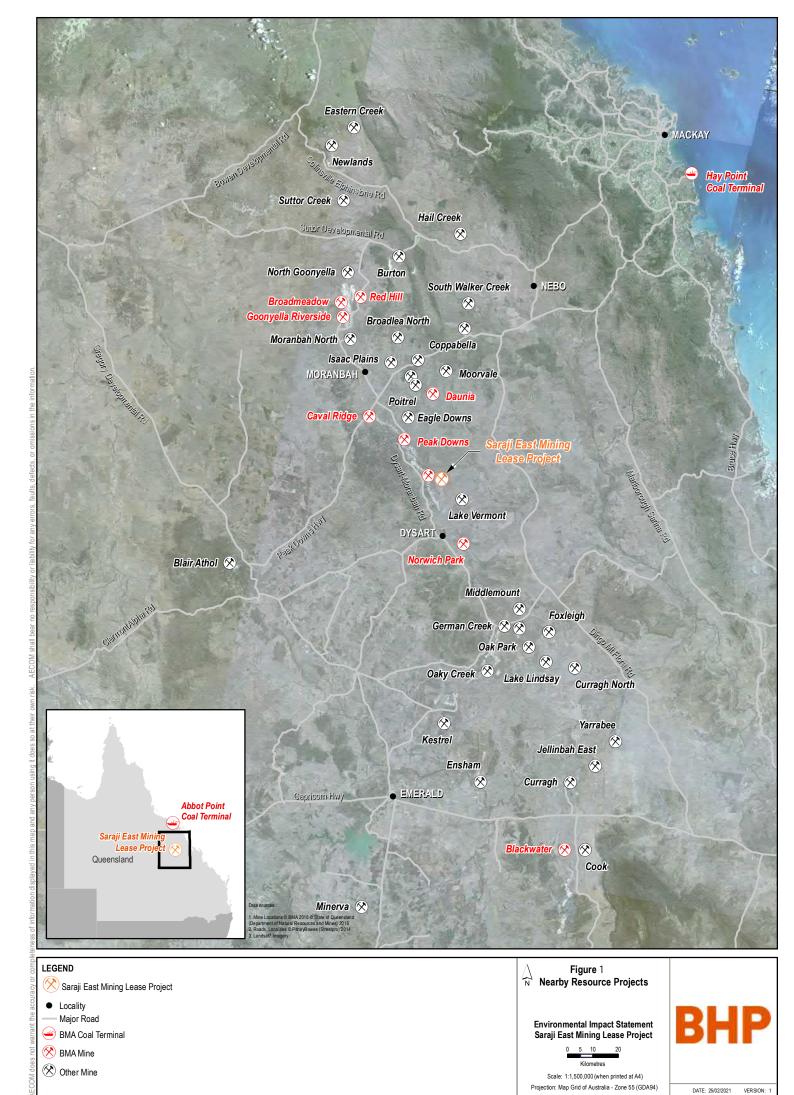
Financial year	Mining activities	Project Stage	Run of Mine (ROM) (Mtpa)	Product coal (Mtpa)
2021-2023 i.e. Project years 1-3	Development of the mine portal and associated infrastructure areas.	Stage 1	-	-
2023-2042 i.e. Project years 3-20	Thick seam mining within the Dysart Lower (D24 and D14) seam.	Stage 2 Stage 3	Up to 11 Mtpa	Up to 8 Mtpa

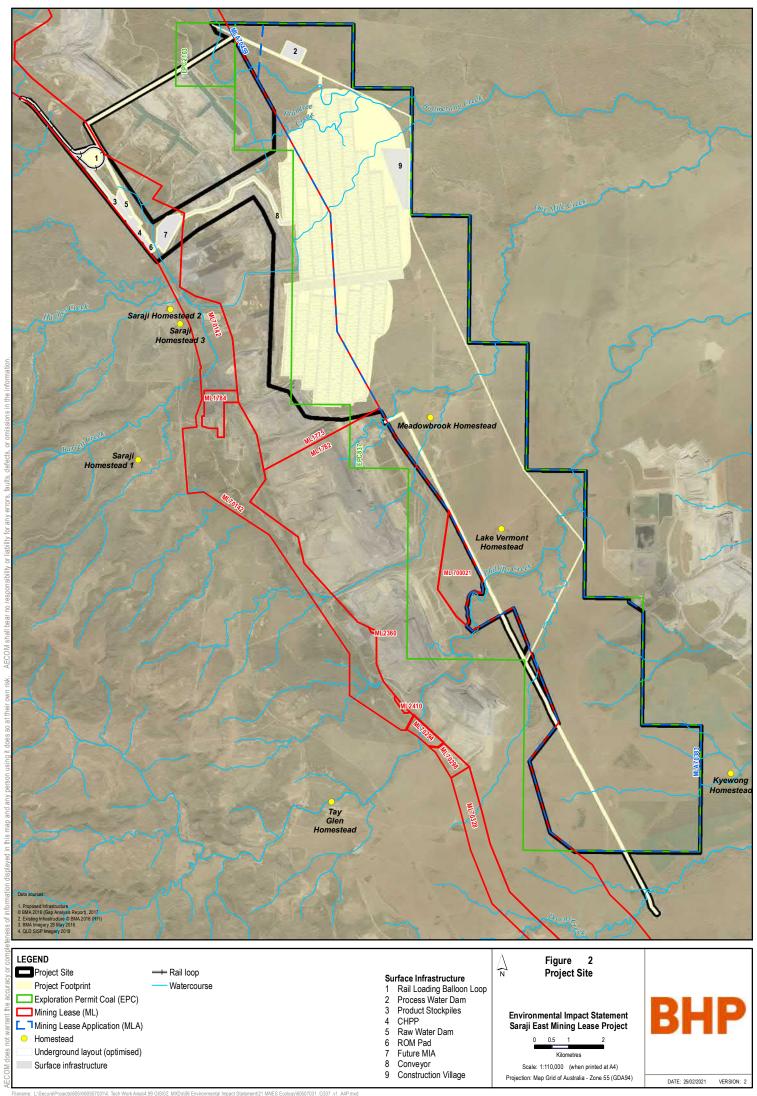
1.2.1 Existing Saraji Mine

The Project Site is located adjacent to, and in some cases overlaps, areas which are currently approved as the existing BMA Saraji Mine.

The existing Saraji Mine is an active, open cut mine owned by the Central Queensland Coal Associate (CQCA) Joint Venture, namely BHP Coal Pty Ltd, BHP Queensland Coal Investments Pty Ltd, Umal Consolidated Pty Ltd, QCT Resources Pty Limited, QCT Mining Pty Ltd, QCT Investments Pty Ltd and Mitsubishi Development Pty Ltd. The CQCA is an unincorporated joint venture between BHP Billiton (50 per cent) and Mitsubishi Corporation (50 per cent). The existing Saraji Mine is operated by BMA under a management agreement.

The existing Saraji Mine is approved to undertake open cut operations on ML 1775, ML 70142, ML 1784, ML 1782, ML 2360, ML 2410, ML 70294, ML 70298, ML 70328 and ML 700021 under Environmental Authority (EA) Permit No. EPML00862313. The existing Saraji Mine is not within the scope of this report and BMA will continue to undertake open cut mining operations, and related activities (for example rehabilitation), at the existing Saraji Mine in accordance with the terms of its existing approvals.





2.0 Legislative framework

Offset policies under both Commonwealth and State government legislation are relevant to the Project. This section outlines principles and applicability of each policy of relevance to the Project.

2.1 Commonwealth legislation and policy

2.1.1 Applicability

On 5 October 2016, BMA referred the Project to the Department of the Environment and Energy (DoEE) (now Department of Agriculture, Water and the Environment (DAWE)) for a decision as to whether the Project constitutes a 'controlled action' that would require assessment and approval under the EPBC Act (Referral No. 2016/7791).

On 18 October 2016, the Project was determined to be a controlled action under the EPBC Act due to the potential impacts on Matters of National Environmental Significance (MNES). The relevant controlling provisions under the EPBC Act were determined as being:

- Nationally listed threatened species and communities (Section 18 and 18A)
- A water resource, in relation to coal seam gas development and a large coal mining development (Section 24D and 24E).

Environmental offsets are required where significant residual impacts on MNES occur from the proposed Project activities.

2.1.2 Environmental Offsets Policy

The Project will be subject to the EPBC Act Environmental Offsets Policy 2013 that aims to:

- ensure the efficient, effective, timely, transparent, proportionate, scientifically robust and reasonable use of offsets under the EPBC Act
- provide proponents, the community and other stakeholders with greater certainty and guidance on how offsets are determined and when they may be considered under the EPBC Act
- deliver improved environmental outcomes by consistently applying the policy
- outline the appropriate nature and scale of offsets and how they are determined
- provide guidance on acceptable delivery mechanisms for offsets.

The EPBC Act Environmental Offsets Policy 2013 identifies eight requirements for suitable offsets:

- deliver an overall conservation outcome that improves or maintains the viability of the protected matter
- be built around direct offsets but may include other compensatory measures. Advanced offset will be considered
- be in proportion to the level of statutory protection that applies to the protected matter and be tailored specifically to the attribute of the protected matter that is impacted
- be of a size and scale proportionate to the residual impacts on the protected matter
- effectively account for and manage the risks of the offset not succeeding
- be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs (this does not preclude the recognition of state or territory offsets that may be suitable as offsets under the EPBC Act for the same action)
- suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable
- have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.

Offsets that align with conservation priorities for the impacted protected matter and are tailored specifically to the attribute of the protected matter being impacted will deliver a conservation gain; for example, if the proposed action is likely to have impacts on foraging habitat for a protected matter, then the offset should aim to create, improve, protect and/or manage foraging habitat.

2.2 State legislation and policy

2.2.1 Applicability

The Terms of Reference (ToR) for the Project EIS requires discussion of environmental offset requirements in accordance with the EO Act and the EO Policy. Environmental offsets are required where significant residual impacts on MSES occur from the proposed Project activities.

2.2.2 Environmental Offsets Act 2014 and Environmental Offsets Regulation

The *Environmental Offsets Act 2014* (EO Act) coordinates the delivery of environmental offsets across jurisdictions and provides a single point-of-truth for offsets in Queensland.

The Environmental Offsets Regulation 2014 (EO Reg) provides details of the prescribed activities regulated under existing legislation and prescribed environmental matters to which the EO Act applies. These matters are MNES, Matters of State Environmental Significance (MSES) and Matters of Local Environmental Significance (MLES).

2.2.3 Environmental Offsets Policy 2017

The Environmental Offsets Policy 2017 Version 1.5 (EO Policy) provides a single, consistent, whole-of-government policy for the assessment of offset proposals to satisfy offset conditions. The EO Policy outlines seven principles that environmental offsets must meet:

- offsets will not replace or undermine existing environmental standards or regulatory requirements or be used to allow development in areas otherwise prohibited through legislation or policy
- environmental impacts must first be avoided, then minimised, before considering the use of offsets for any remaining impact
- offsets must achieve a conservation outcome that achieves an equivalent environmental outcome
- offsets must provide environmental values as similar as possible to those being lost
- offset provision must minimise the time-lag between the impact and delivery of the offset
- offsets must provide additional protection to environmental values at risk, or additional management actions to improve environmental values
- where legal security is required, offsets must be legally secured for the duration of the impact on the prescribed environmental matter

For land-based offsets, the suitability of the offset site relative to the impact site and the prescribed environmental matters is measured through undertaking a habitat quality analysis. The Guide to Determining Terrestrial Habitat Quality (Department of Environment and Heritage Protection, 2017) must be used for Regional Ecosystems (REs) and species offsets (including advanced offsets) to undertake this analysis, unless an alternative approach is approved by DES as being able to measure a conservation outcome.

The proposed clearing areas and proposed offset sites will need to be assessed by undertaking habitat quality analysis. These assessments will be completed and outlined in a Project offset management plan to be developed subsequently to this offset strategy.

2.3 Interaction between Commonwealth and State legislation and policy

Potential synergies exist between the EPBC Act EO Policy and offset policies administered by the Queensland Government. The EPBC Act Environmental Offsets Policy and EO Act support the development of complementary offset packages. The overlapping MNES and MSES will be considered when developing offset packages for the Project and offset delivery will preferentially secure offset areas which satisfy both MNES and MSES. However, in accordance with the

Queensland EO Policy offset liabilities will not be unnecessarily duplicated and where interactions between commonwealth and state offsets apply:

- the State cannot impose an offset condition for the same or substantially the same impact if the Commonwealth has assessed an activity as a controlled action and decided that an offset is, or is not, required
- State agencies cannot impose an offset condition for the same or substantially the same impact if another State agency has already imposed an offset condition.

3.0 Significant residual impacts

To correlate with proposed Project timing (Table 1), significant residual direct and indirect impacts are predicted through the following stages:

- Stage 1 relates to direct impacts anticipated during construction, which is expected to occur over a three-year period (FY 2021-2023) and include:
 - Year 1: Construction of mine portal, construction accommodation village, incidental mine gas (IMG) drainage infrastructure (three western-most gas wells and three western-most locations for the gas pipeline), raw water dam and process water dam.
 - Year 2 and 3: Construction of powerline (close to Meadowbrook homestead), MIA, CHPP, rail loop and load out, vent shafts and water pipelines.
- Stage 2 relates to 50 percent of indirect impacts during operation including underground mining to extract and process coal
- Stage 3 relates to the remaining 50 percent of indirect impacts during operation including underground mining to extract and process coal.

Significant residual impacts are presented based on a worst-case scenario of 100 percent disturbance from each Project stage. Using maximum predicted significant residual impacts provides for a conservative assessment of potential impacts, while the final extent of disturbance is likely to be significantly less.

As an example, maximum predicted significant residual impact assumes ponding occurs uniformly across the goaf of each longwall to provide for conservative assessment of potential impacts. It is more likely residual ponding will be localised and will not occur across the entire subsidence landscape due to the ephemeral nature of major creek lines within the Project Site and limited change in pre and post subsidence flow conditions. Modelling demonstrates residual pooling will be localised, short term and account for a change of approximately half a per cent of total flow volume during rainfall for both a 50 year and 100 year average recurrence interval (ARI) (Alluvium, 2019).

Similarly, for conservative assessment purposes, subsidence-affected areas are assumed to experience disturbance impacts while, in practice, the final post subsidence landscape is unlikely to be uniformly affected and therefore impacts will be reduced. Subsidence-induced movement in soil profiles and the formation of cracks and fissures can lead to stress on the roots of trees and shrubs and localised root shearing, indirectly impacting on vegetation health; as a worst-case scenario, this may result in root failure and premature death of individual trees. It is likely that the extent of indirect impacts from subsidence (Stage 2 and 3) will be lower. However, to achieve a conservative impact assessment, it is assumed that subsidence will adversely impact habitat and that these impacts will occur uniformly across subsidence affected areas. Monitoring of subsided areas is proposed to be conducted on a periodic basis to determine and quantify impacts.

In addition, the benefits of proposed mitigation measures and potential to reduce the extent of estimated impacts are not accounted for in establishing the extent of significant residual impact as they are difficult to accurately quantify. For example, where ponding does occur, new habitat opportunities for some fauna groups may be created. BMA will also use sensitive design and site selection to avoid high-value environmental areas for the protection of MSES and MNES where practical opportunities exist.

3.1 Matters of National Environmental Significance

The EPBC Act Protected Matters Search identifies listed threatened species, migratory species and threatened ecological communities (TEC) have potential to occur within or in the vicinity of the Project Site; however only TEC and threatened species are known or likely to occur.

For known or likely TEC and threatened species, significance of Project impacts has been assessed against the *EPBC Act Significant Impact Guidelines 1.1* (DotE, 2013). This assessment confirmed significant impacts on TEC and threatened species protected under the EPBC Act. While mitigation and management measures for impacts focus on maximising retention of MNES values across the Project footprint, significant residual impacts on TEC and listed threatened species will remain.

For TECs and threatened species, maximum predicted significant residual impact has been determined based on:

- TEC and species evaluated to be significantly impacted by the Project
- the extent of adverse impact that will remain following the development of the Project.

Within the Project Site this comprises area of direct and indirect impact on the habitat that is most important to the species or ecological community and therefore triggered a significant residual impact, including:

- all areas of Brigalow TEC (Section 3.1.1, shown in Figure 3)
- preferred habitat for Squatter Pigeon (Section 3.1.2.1, shown in Figure 4)
- preferred habitat for Koala (Section 3.1.2.2, shown in Figure 5)
- preferred habitat for Greater Glider (Section 3.1.2.3, shown in Figure 6)
- important (suitable) habitat for Ornamental Snake (Section 3.1.2.4, shown in Figure 7).

The quantified extent of maximum predicted significant residual impacts on MNES for the Project are outlined in Table 2, with a concise discussion outlining the rationale for determining the residual impact extent also provided.

Table 2 Maximum predicted signi	ficant residual impacts on MNES
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MNES	Maximum predicted significant residual impact (ha)						
WINES	Stage 1	Stage 2	Stage 3	Total			
Brigalow TEC	33.8	95.1	95.1	224.0			
Squatter Pigeon preferred habitat	72.2	313.5	313.5	699.2			
Ornamental Snake suitable habitat	335.2	295.1	295.1	925.4			
Koala preferred habitat	33.0	65.0	65.0	163.0			
Greater Glider preferred habitat	10.6	33.8	33.8	78.2			

3.1.1 Brigalow TEC

Impacts to Brigalow TEC from Stage 1 will be offset in their entirety and offsets for Stages 2 and 3 will be delivered based on additional monitoring and determination of impacts from subsidence up to the potential maximum extent indicated in Table 2.

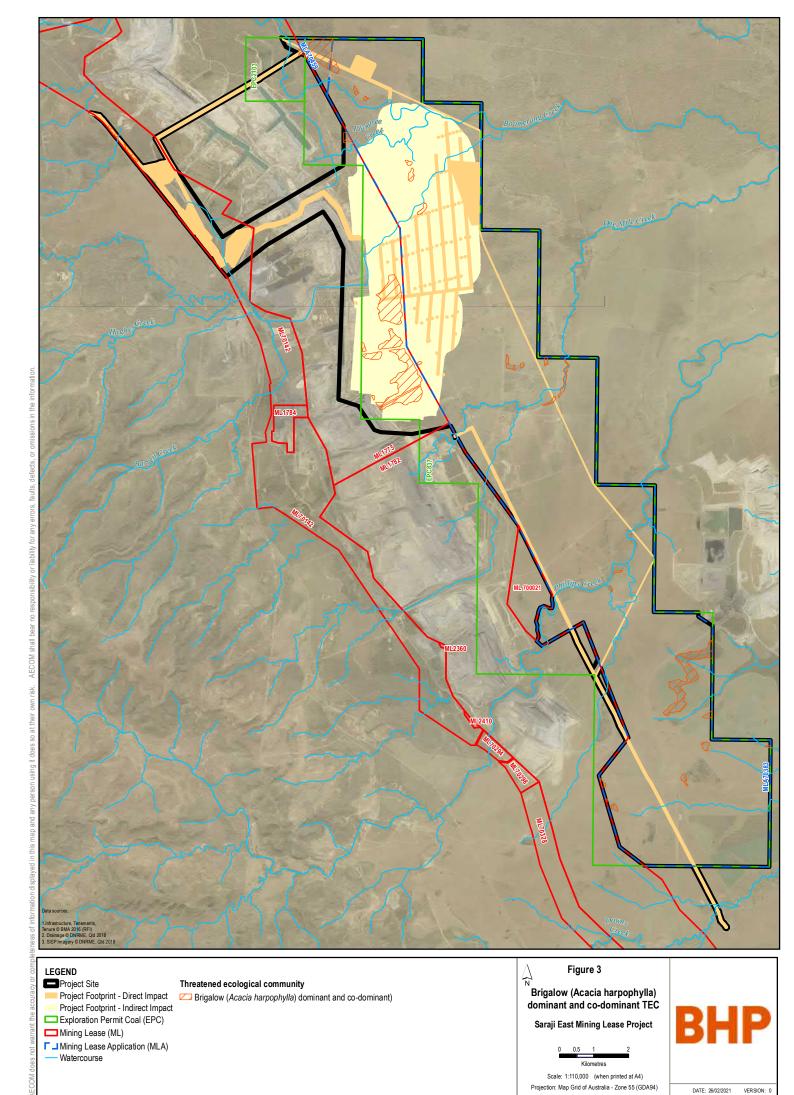
Direct impacts of clearing associated with Stage 1 will remove the TEC representing a significant impact that requires offsets. If indirect impacts cause vegetation to lose its status as the Brigalow TEC when assessed against the listing criteria¹ (e.g. due to subsidence causing root cracking or ponding with waterlogging), these impacts will also be considered significant and will be offset, as they will contribute to the cumulative loss associated with the Project. It is important to note that individual impacts from indirect impacts may be small in extent and in isolation not considered significant, however, a good practise approach to compensating for unavoidable Project impacts is being adopted.

Through offset mechanisms (Section 4.0), the Project will aim to prevent further decline of endangered Brigalow TEC by protecting and improving quality of remnant and regrowth vegetation in the Brigalow TEC core distribution.

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¹ I.e. the key diagnostic characteristics and condition thresholds, set out in the approved Conservation Advice for Brigalow TEC



3.1.2 Threatened species

Unlike for Brigalow TEC, where vegetation either meets the criteria to be considered the TEC or not, there are substantial variations in the habitat resources and values for threatened fauna across the Project Site.

The Project Site has been ground-truthed with preferred, suitable and marginal habitats identified for the threatened fauna (indicated in Table 2) as defined in the Central Queensland Threatened Species Habitat Descriptions (Kerswell A, Kaveney T, Evans C and Appleby L., 2020). These habitat types are likely to be of differing importance to threatened species, with preferred and in some instances, suitable habitat making a meaningful contribution to the maintenance of local populations of these species.

Preferred, suitable and marginal habitat types are defined generally, with further discussion as to the site and species-specific characteristics in the following sections.

- Preferred habitats are those that are most important to the species and contain the features that
 are crucial for the species' persistence in an area. It includes habitats in which key activities are
 undertaken e.g. breeding, roosting and/or where high quality/species limiting foraging resources
 are found. If the species is present in a region, individuals will usually be found in preferred
 habitat.
- **Suitable habitat** provides resources for the species but is not crucial for its persistence in an area. Individuals may be found in suitable habitat but are not likely to be undertaking key activities such as breeding or roosting. Foraging resources may be lower quality or used opportunistically (rather than being depended upon). If the species is present in a region, individuals may be found in suitable habitat but this habitat type may also remain unoccupied.
- Marginal habitat provides limited resources for the species and is not crucial for its persistence
 in an area. Individuals may be occasionally found in marginal habitat but will not be undertaking
 key activities such as breeding, roosting or extensive foraging. If the species is present in a
 region, individuals would be found in marginal habitat only rarely and this habitat type is likely to
 be unoccupied most of the time.

As per the EPBC Act Significant Impact Guidelines 1.1 (Department of the Environment, 2013), a 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value and quality of the environment impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts (Department of the Environment, 2013). The Guidelines direct proponents to consider all these factors when determining whether an action is likely to have a significant impact on MNES.

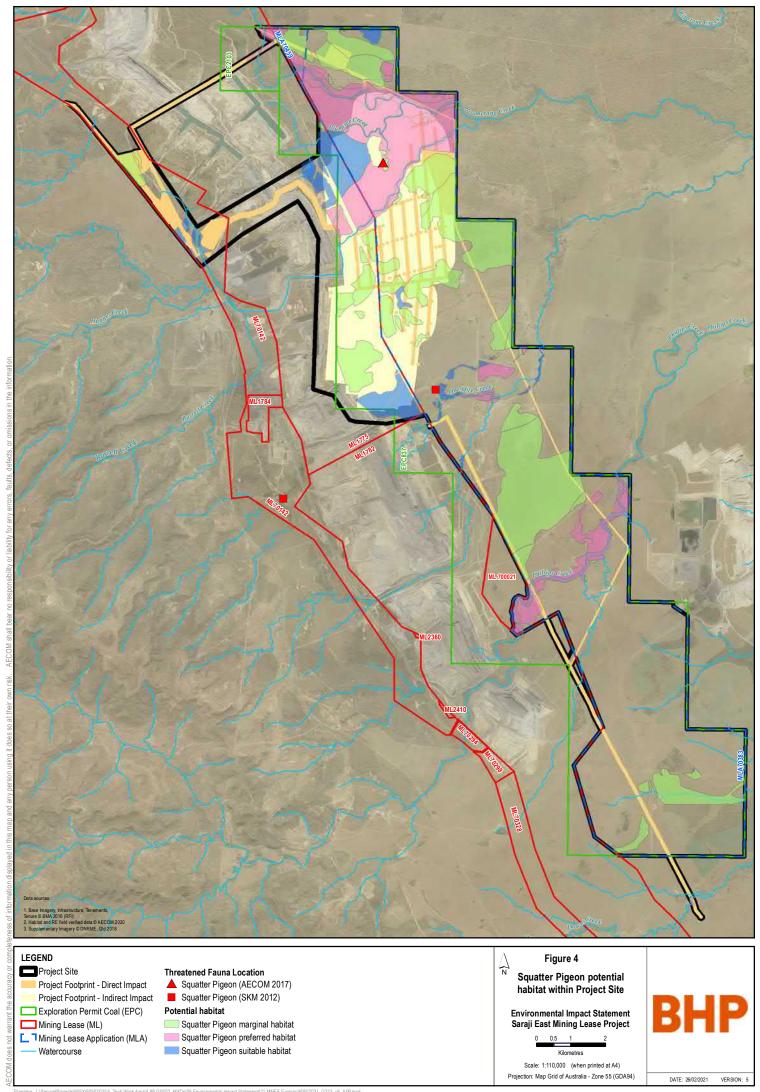
In the context of this Project, the presence and configuration of habitat types (preferred, suitable, marginal), allows for a robust consideration of the sensitivity, value, and quality of the environment which is impacted (as discussed for each relevant species below). A conservative approach to considering the intensity, duration, magnitude and geographic extent of the impacts has been taken by assuming a worst-case scenario and conservative impact assessment approach for each stage.

3.1.2.1 Squatter Pigeon (southern)

Preferred habitat for Squatter Pigeon is defined as remnant or regrowth grassy open forest to woodland dominated by Eucalyptus, Corymbia, Callitris or Acacia with patchy, relatively sparse ground cover vegetation (33 per cent) and sparse shrub layer on well-draining sandy, loamy or gravelly soils within one kilometre of a suitable permanent waterbody in the Central Queensland Threatened Species Habitat Descriptions (Kerswell A, Kaveney T, Evans C and Appleby L., 2020). Preferred habitat for Squatter Pigeon is mapped in Figure 4.

Within the Project Site, preferred habitat is primarily located in a consolidated patch where Boomerang, Plumtree and Hughes Creek converge and represents the most important habitat areas to be influenced by the Project. It is where breeding will occur, if the species is breeding at this site, and provides a large and connected patch of habitat across three creek systems. As such, the preferred habitat within the north of the Project Site is the most sensitive and of most value to Squatter Pigeon. This area also intersects with direct impacts (clearing) and indirect impacts (subsidence-related disturbance) and a conservative approach has been taken in assuming any areas where the footprint intersects preferred habitat will be unavoidably impacted. Therefore, these impacts represent the significant residual impact that will be offset, up to the maximum potential impact extents provided in Table 2.

BMA will consider the conservation outcomes in The Action Plan for Australian Birds 2000 (Garnett, 2000) in finalising the offset management and monitoring strategies for this species.



3.1.2.2 Koala

In the Central Queensland Threatened Species Habitat Descriptions (Kerswell A, Kaveney T, Evans C and Appleby L., 2020), preferred habitat for Koala is defined as contiguous remnant eucalyptus open forest to woodlands on alluvial and/or cracked rock groundwater where palatable food tree species occur frequently (and are usually dominant). This specifically includes stream fringing open forest, open forest or woodland on alluvial terraces where *Eucalyptus tereticornis/camaldulensis* are dominant or common subdominant elements.

Other important food species on the alluvial terraces can include E. *coolibah*, E. *crebra*, E. *melanophloia* and E. *popunea*. Preferred habitat areas located where aquifers persist through most drought cycles, substrates have high fertility and food tree species occur at relatively high frequencies have the potential to support moderate to high density koala populations. Preferred habitat areas represented as Eucalyptus *crebra/drepanophylla* tall woodland on hills and ranges with aquifers that persist in most drought cycles (commonly cracked rock aquifers) have the potential to support a low to moderate density koala population e.g. Clarke-Connors Ranges, Minerva Hills.

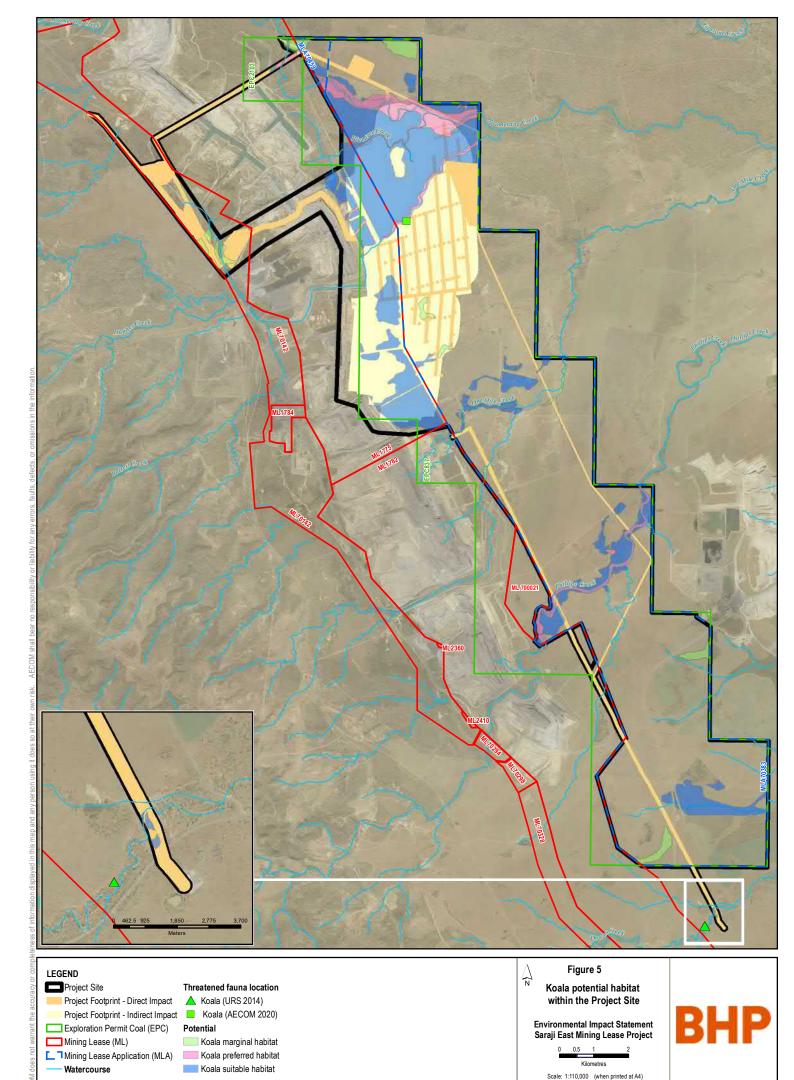
Within the Project Site, preferred habitat is located within the riparian zones of creeks containing food trees (River Red Gum riparian woodland, oxbox woodland and Eucalytpus and Corymbia open woodlands), with large extents located along Boomerang and Hughes Creek. A known record of Koala is present within the preferred habitat fringing Hughes Creek. The preferred habitat areas provide key foraging resources and facilitate movement of the species across the landscape. Consequently, the preferred habitat areas are the most sensitive and valuable areas of habitat to the Koala within the Project Site. Preferred habitat for Koala is mapped in Figure 5.

An additional large, contiguous patch of suitable habitat exists between the area of preferred habitats located along the riparian zones of Boomerang and Hughes Creek. This suitable habitat provides connectivity between the two creek systems and their riparian zones and is likely to be utilised as a movement corridor for Koala. These areas support the functionality of preferred habitat, but are unlikely to provide critical habitat resources in a standalone capacity. Additional areas of suitable habitat are in the southern portion of the Project Site and although large areas, for the most part, they are not connected to preferred habitat and therefore are likely to be of lower value to the species, in the local context.

Small patches of marginal habitat are scattered across the Project Site, with the largest patch located in the north eastern corner of the Project Site. These areas of marginal habitat are isolated from other areas of suitable and preferred habitat and are unlikely to be of importance to Koala within the Project Site.

Preferred habitat provide key foraging resources, as they are the areas that are most likely to retain leaf moisture throughout the year. They also provide important connectivity throughout and out of the Project Site, which facilitates movement of Koala across the landscape. Allowing for these connectivity values is important both for facilitating interactions of individuals in low density central Queensland populations, as well as providing corridors to avoid predators and seek refuge from adverse conditions. These preferred habitat areas are therefore considered to be the most sensitive and valuable to the Koala within the Project Site. This area also intersects with direct disturbance areas and also areas of potential subsidence and a conservative approach has been taken in assuming any areas where the footprint intersects preferred habitat will be unavoidably impacted. Therefore, these impacts represent the significant residual impact that will be offset, up to the maximum potential impact extents provided in Table 2. Areas of suitable and marginal habitat provide lower or limited habitat value for Koala in the local context of the Project Site. Whilst impacts to these areas are anticipated, they are not expected to significantly interrupt utilisation and functionality of habitat and are therefore not considered to be significant residual impacts. Consequently, offsets for impacts to these areas are not proposed.

BMA will consider the conservation outcomes in Koala referral guidelines (Department of the Environment, 2014) in finalising the offset management and monitoring strategies for this species.



Projection: Map Grid of Australia - Zone 55 (GDA94)

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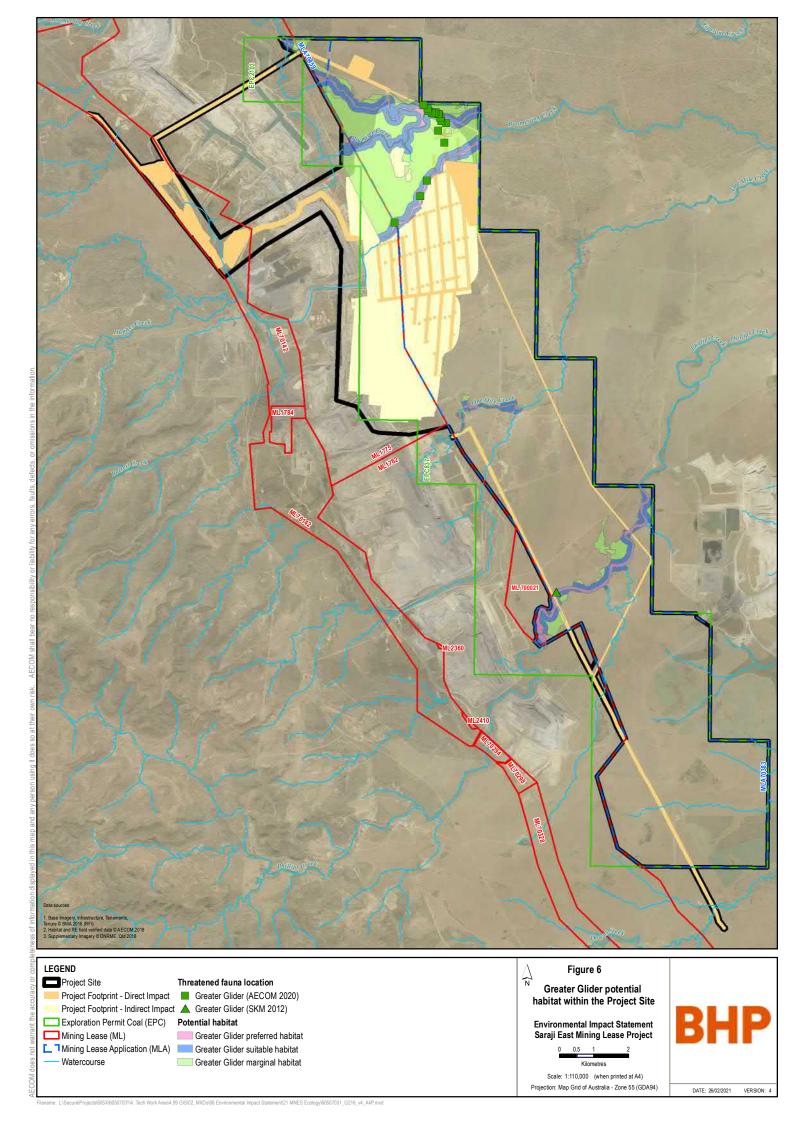
3.1.2.3 Greater Glider

In the Central Queensland Threatened Species Habitat Descriptions (Kerswell A, Kaveney T, Evans C and Appleby L., 2020), preferred habitat for Greater Glider is defined as remnant connected eucalypt woodlands containing more than two hollow bearing trees/ha, with hollows medium-large in size (>10 cm entrance). In Central Queensland, preferred foraging and den trees include *E. camaldulensis*, *E. tereticornis*, *E. fibrosa* and *Corymbia citriodora*. The species has also been observed in *Angophora floribunda*, *Eucalyptus cambageana*, *E. coolabah*, *E. crebra*, *E. laevopinea*, *E. moluccana*, *E. orgadophila*, *E. populnea*, *E. melanophloia* and *C. tessellaris* in which it may use for foraging and/or denning.

Within the Project Site, preferred habitat for Greater Glider is located within the riparian zones of creeks, with the habitat supporting a known local population on Boomerang, Plumtree and Hughes Creeks. The preferred habitat along riparian zones within the Project Site Resources provide key denning (hollows) and foraging resources and has been shown to support a number of individuals. These areas of preferred habitat also provide important connectivity throughout and out of the Project Site, which facilitates movement of Greater Glider across the landscape. As for Koala, allowing for these connectivity values is important both for facilitating interactions of individuals in low density central Queensland populations, as well as providing corridors to avoid predators and seek refuge from adverse conditions. Preferred habitat for Greater Glider is mapped in Figure 6.

Given the presence of denning resources (hollows), connectivity of habitat and the existence of numerous records of the species, it is considered that the area of preferred habitat are the most sensitive and of most value to Greater Glider within the Project Site. This area also intersects with direct disturbance areas and areas of potential subsidence and a conservative approach has been taken in assuming any areas where the footprint intersects preferred habitat will be unavoidably impacted. Therefore, these impacts represent the significant residual impact that will be offset, up to the maximum potential impact extents provided in Table 2.

BMA will consider the conservation outcomes for the vulnerable Greater Glider (Department of the Environment, 2015) in finalising the offset management and monitoring strategies for this species.



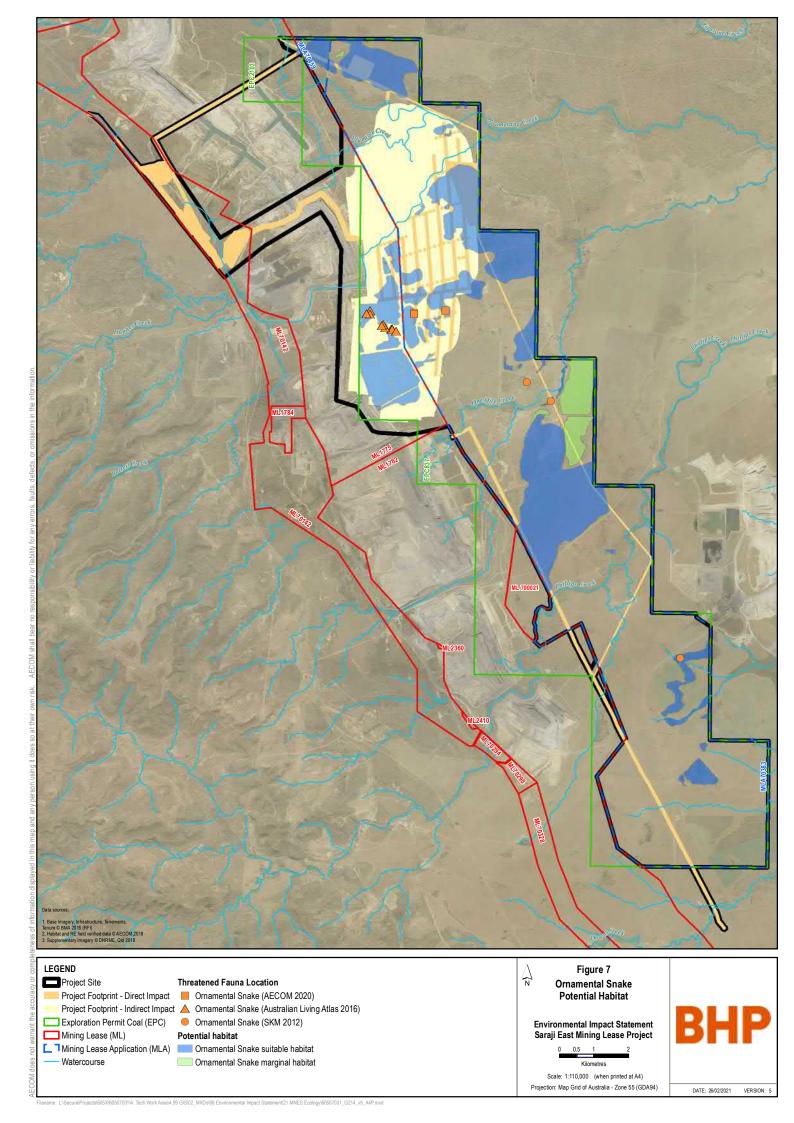
3.1.2.4 Ornamental Snake

In the Central Queensland Threatened Species Habitat Descriptions (Kerswell A, Kaveney T, Evans C and Appleby L., 2020), preferred Ornamental Snake habitat is defined as gilgai depressions (with or without the presence of brigalow or other canopy vegetation), mounds and wetlands on cracking clays (predominantly land zone 4) where essential microhabitat features are present including an abundance of deep soil cracks and fallen woody debris, subject to seasonal flooding.

These areas are not present within the Project Site. However, individuals of the Ornamental Snake have been recorded within the Project Site in habitats that meet the definition of suitable habitat as defined in the Central Queensland Threatened Species Habitat Descriptions (Kerswell A, Kaveney T, Evans C and Appleby L., 2020). Suitable habitat includes dispersal areas within one (1) kilometre of preferred habitat currently or previously dominated by brigalow or coolibah communities where gilgais or soil cracks are infrequent or are shallow or non-remnant areas. Suitable habitat also includes areas currently or previously dominated by brigalow or coolibah communities where gilgais or soil cracks are infrequent or are shallow and multiple species records are present. Suitable habitat for Ornamental Snake is mapped in Figure 7.

Within the Project Site, these suitable habitat areas are represented as large and reasonably connected patches, primarily in the areas between Hughes Creek and One Mile Creek, with numerous previous records of the species located to the east of the existing operations at Saraji mine. Given both the size, configuration and location of suitable habitat and the existence of previous records of the species, it is considered that this area of suitable habitat is the most sensitive and of most value to Ornamental Snake within the Project Site. This area also intersects with direct disturbance areas and areas of potential subsidence and a conservative approach has been taken in assuming any areas where the footprint intersects suitable habitat will be unavoidably impacted. Therefore, these impacts represent the significant residual impact that will be offset, up to the maximum potential impact extents provided in in Table 2.

BMA will consider the conservation outcomes for Ornamental Snake (Department of the Environment, 2014) in finalising the offset management and monitoring strategies for this species.



3.2 Matters of State Environmental Significance

Project impacts on identified MSES have been assessed in accordance with the Significant Residual Impact (SRI) Guidelines prepared by the Department of the Environment and Heritage Protection (2014) (AECOM, 2020). The outcome of this assessment confirmed significant residual impacts on Regulated Vegetation and Connectivity. The quantified extent of significant residual impacts on MSES for the Project are outlined in Table 3.

To avoid duplication of offset conditions between jurisdictions, state and local governments can only impose an offset condition in relation to a prescribed activity if the same or substantially the same impact and the same or substantially the same matter has not been subject to assessment under the EPBC Act. As such, SRI assessments for protected wildlife habitat have only been completed for the known or likely conservation significant species that have not already been assessed under the EPBC Act policy statement Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (DotE, 2013).

Table 3 Maximum predicted significant residual impacts on MSES

MSES	Description	Maximum predicted significant residual impact (ha)					
WISES	Description	Stage 1	Stage 2	Stage 3	TOTAL		
Regulated vegetation (Endangered / Of Concern REs)	Endangered: RE 11.4.8 RE 11.4.9 (BVG 25a)	31.1	102.8	102.8	239.7		
	Of Concern: RE 11.3.2 (BVG 17a)	17.0	28.1	28.1	73.2		
Regulated vegetation (within the defined distance of a watercourse)	Watercourses associated with RE 11.3.2 RE 11.5.3 (BVG 17a)	3.2	10.2	10.2	23.6		
	Watercourses associated with RE11.3.25 (BVG 16a)	9.4	27.8	27.8	64.0		
Connectivity areas	All remnant vegetation	146.5	561.4	561.4	1,269.2		

4.0 Approach to provision of offsets

BMA is committed to reducing potential impacts on MNES and MSES through avoidance and mitigation measures with offsets employed as a secondary measure to ameliorate residual impacts. The approach to providing these offsets is detailed below.

4.1 Offset development

Offset development will occur prior to Project construction and will include the following steps:

- quantify the area of disturbance and conduct site habitat quality analysis of potentially impacted biodiversity values
- identify offset options, including land-based, financial payment and co-location opportunities
- prepare Offset Management Plan identify suitable offset areas which meet criteria for the specific environmental value and confirm offset areas for the maximum disturbance area pertaining to the relevant Project stage.

These steps are further detailed below.

4.1.1 Estimate disturbance and conduct habitat quality analysis

The maximum predicted disturbance areas represent a conservative estimate of the likely actual losses. Terrestrial habitat quality analysis of disturbance areas will involve site specific surveys to verify the baseline condition of the biodiversity values for the site and inform the start quality of impact area for the Offset Management Plan.

Habitat quality is assessed within assessment units through a strategic combination of indicators that measure the overall viability of the site and its capacity to support assessment of habitat quality in line with the framework for Commonwealth offset habitat quality calculation requirements. The key indicators for determining habitat quality of an offset site are:

- Site condition: condition of a site in relation to the ecological requirements of a threatened species or ecological community
- Site context: relative importance of a site in terms of its position in the landscape, taking into account the connectivity needs of a threatened species or ecological community
- Species stocking rate: usage and/or density of a species at a particular site.

Habitat quality analysis of disturbance areas will use the habitat quality scoring methodology as per the Queensland Government *Guide to determining terrestrial habitat quality* (Department of Environment and Heritage Protection [DEHP], 2017) to inform the Commonwealth offset habitat quality calculation requirements. This guide outlines the specific methodology for assessing habitat quality, which is determined by three indicators – site condition, site context and species habitat index. There is no stipulated Commonwealth method for assessing the three components of habitat quality. The terrestrial habitat quality scoring methodology will calculate the Commonwealth habitat quality inputs for the Offsets Assessments Guide (OAG) (Commonwealth Government, 2012).

The linkages between the EPBC offsets assessment guide habitat quality components and the Queensland guide are outlined in Table 4.

Table 4 Commonwealth habitat quality components and associated Queensland habitat quality indicators

Commonwealth habitat quality components	Queensland habitat quality indicators
Site condition: This is the condition of a site in relation to the ecological requirements of a threatened species or ecological community. This includes considerations such as vegetation condition and structure, the diversity of habitat species present, and the number of relevant habitat features.	Site condition: A general condition assessment of the following vegetation attributes compared to a benchmark: Canopy height and cover Shrub cover Species richness Recruitment Number of large trees Coarse woody debris Native perennial grass cover and organic litter
Site context: This is the relative importance of a site in terms of its position in the landscape, taking into account the connectivity needs of a threatened species or ecological community. This includes considerations such as movement patterns of the species, the proximity of the site in relation to other areas of suitable habitat, and the role of the site in relation to the overall population or extent of a species or community.	Site context: An analysis of the site in relation to the surrounding environment based on the following landscape attributes: Patch size Connectedness Patch context Ecological corridors
Species stocking rate: This is the usage and/or density of a species at a particular site. The principle acknowledges that a particular site may have a high value for a particular threatened species, despite appearing to have poor condition and/or context. It includes considerations such as survey data for a site in regards to a particular species population or, in the case of a threatened ecological community this may be a number of different populations. It also includes consideration of the role of the site population in regards to the overall species population viability or community extent.	Species habitat index: The ability of the site to support a species based on the following factors: Presence and severity of threats to the species Quality and availability of food and foraging habitat Quality and availability of shelter Species mobility capacity Role of the site to the species overall population in the State

4.1.2 Proposed offset options

For significant residual impacts to MNES, offset is primarily provided through direct land-based offsets (actions that provide a measurable conservation gain for an impacted protected matter) (DSEWPaC, 2012) with contribution of other compensatory measures that do not directly offset the impacts on the protected matter, but are anticipated to lead to benefits for the impacted matter i.e. funding for research (DSEWPaC, 2012). Direct offsets must make up at least 90 per cent of an offsets package.

Offset options for MSES under Queensland's EO Policy include financial settlement offsets, proponent-driven offsets (land-based offsets) or a combination of the two (DEHP, 2017).

The proposed offset approach may use a series of offset options available. The proposed approach by BMA involves the following offset options in order of preference:

- 1. Use of properties owned by BMA
- 2. Purchase other offset properties
- 3. Entering into agreements to secure offsets with third party landholders with land with the relevant characteristics
- 4. Use of offset payments to allow government bodies to secure the required offsets through negotiation and consultation with government bodies

5. Use of indirect offsets should the options above fulfil a proportion of the offset requirement.

Potential synergies exist between the EPBC Act EO Policy and offset policies administered by the Queensland Government. The EPBC Act EO Policy and Queensland EO Act support the development of complementary offset packages. The overlapping MNES and MSES will be considered when developing offset packages for the Project and offset delivery will preferentially utilise offset areas which satisfy both MNES and MSES.

An assessment of potential offset availability for land-based offsets has been undertaken using a spatial analysis. The methodology and results of this assessment are outlined in Section 5.0.

4.1.3 Offset Management Plan

The Offset Management Plan will present results of the habitat quality assessments within the Project Site and the offset areas identified. The Offset Management Plan will:

- finalise the offset mechanism to be used for the Project (outlined in Section 5.0)
 - identify any BMA owned properties that will be secured as offsets, their locations and contribution towards offset requirements
 - identify those offset requirements that will be secured through the provision of other offset lands
 - identify offset requirements that will be secured through an offset payment
 - identify any indirect offset proposals
- identify conservation outcomes and performance criteria (Section 4.1.3.1)
- identify ongoing management actions and risks (Section 4.1.3.2)
- identify monitoring and reporting (Section 4.1.3.3).

Preferred offset proposals and suitability are described in Section 5.0. The Offset Management Plan will also include details such as the duration and responsibilities for active management, reporting, monitoring and measures to achieve condition improvement requirements.

Prior to construction, BMA will develop and implement the Offset Management Plan. Proposed outline of the structure for the Offset Management Plan is presented in Section 4.1.4.

The Offset Management Plan will be periodically reviewed for consistency against the EPBC Act EO Policy (2012). Annual reporting may be required to be undertaken to assess the progress of the offset area against biodiversity objectives. The Offset Management Plan will be audited every 5 years.

4.1.3.1 Conservation outcomes

The overall desired conservation outcome of the proposed offset area is to reduce threatening processes and increase the habitat quality of the area to a level that provides greater conservation value than the current impact site. More specifically, the desired conservation outcome for ecological communities is to protect and restore current regrowth areas to remnant condition and maintain low level of weed invasion. For threatened fauna offsets, the conservation outcome is to increase the habitat quality of the area and reduce threats to the species.

To ensure conservation values are met, performance criteria will be established for ecological condition, weeds and pests for each offset area. Multiple ecological condition indicators will be measured to achieve minimum scores to demonstrate an increase ecological condition of the offset area. After 20 years of management, the offset area will improve in condition and provide a positive conservation outcome or gain for values that will be lost at the impact site – at a minimum:

- The offset site must reach a minimum final condition equal to that of the impact site.
- The final condition score of the offset site will improve by at least one point over the life of the offset. This increase may be greater, if required to ensure the final offset condition is equal to that of the offset site.

4.1.3.2 **Management actions**

Through the implementation of management actions, the condition of the vegetation and offset values within the offset sites will be improved from the baseline habitat quality to achieve the completion criteria within 20 years of commencement of the Offset Management Plan and the offset area will be secured for the life of the approval, for the purposes of an environmental offset.

Context improvement will be achieved through the management of the broader property to reduce the likelihood of edge effects, weed invasion and provides security to the habitat connectivity in place. A controlled grazing regime will be introduced as part of the Offset Management Plan based on local conditions and knowledge and conform to the published science on grazing in native woodlands and grasslands. Through active management it is anticipated that the selected offset area will provide continued and improved fauna colonisation, particularly through the management of grazing pressure and the control of feral animals.

To achieve the desired conservation outcomes for the offset areas, BMA will implement management actions and restrictions tailored to threats to the MNES and relevant threat abatement plans. Specific species management measures will be outlined in the Offset Management Plan once an offset site is selected. These management actions will be further developed in the Offset Management Plan with consideration of relevant abatement plans regarding:

- access controls
- fencing to restrict informal access
- controlled grazing
- weed suppression and control
- pest control
- management of fire risk
- revegetation and supplementary planting (for areas of non-remnant vegetation).

The responsibility of the offset sites will ultimately be with BHP who will appoint suitably qualified personnel to undertake management and monitoring requirements within the offset sites. Management measures will be amended as necessary in response to regular reviews, monitoring results and changes in legislation.

With routine management activity, the risks associated with offset management can be maintained at a low risk level as indicated in Table 5. A risk assessment update will be carried out during the development of the Offset Management Plan.

Table 5 Risks associated with management actions

Management action	Associated risk	Risk*	Proposed measure to minimise risk	Proposed remedial action if risks occurred
Grazing / Fencing	Overgrazing / grazing pressures	Low	Monitoring of grazing regimes, grass cover and biomass	Alteration of proposed grazing regimes
			Leaseholder monitoring	Maintenance of fencing
Weed control	New weeds	Low	Weed hygiene protocols and monitoring	Weed control
	Weed infestation	Low	Weed control, grazing and monitoring	Additional weed control
Pest control	Pest outbreak	Low	Pest control and monitoring	Additional pest control
Human disturbance	Unauthorised access and disturbance	Low	Leaseholder monitoring	Security measures and signage

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Management action	Associated risk	Risk*	Proposed measure to minimise risk	Proposed remedial action if risks occurred
Fire management	High fuel loads	Low	Leaseholder monitoring	Fuel reduction methods and frequency

^{*} Low = requires routine action; Moderate = requires moderate action < 1 month; High = requires priority action < 2 weeks; Extreme = requires immediate action < 1 week

4.1.3.3 Monitoring and reporting

The Offset Management Plan will detail the performance targets and completion criteria for improving vegetation condition, and therefore MNES habitat quality, within the offset site, to demonstrate the success in achieving the overall conservation outcome. Monitoring activities will include:

- Photo point monitoring at the commencement of the Plan, and then every five years for the remaining 20 years (to be undertaken by a suitably qualified person appointed by the landowner)
- BioCondition at the commencement (baseline), and then every five years for the remaining 20 years (to be undertaken by a suitably qualified person appointed by the landowner)
- Feral animal and weed monitoring conducted concurrently with BioCondition (to be undertaken by a suitably qualified person appointed by the landowner)
- Manager monitoring of grazing, pest plants, pest animals fencing, access and fire breaks (to be undertaken by a suitably qualified person appointed by the landowner).

All monitoring results (including leaseholder/property manager observations) are to be recorded in documented or electronic form suitable for external audit. Reports will be provided to the relevant authorities for review as required.

The frequency of monitoring will be determined based on the current condition of the offset area and the likely rate of change (improvement or decline). Monitoring frequency is likely to be higher in the initial five years as this is generally the period in which the greatest change occurs, and an important period in ensuring management measures have the offset heading in the right trajectory to reach the performance criteria.

BMA will prepare a report on the implementation of this management plan at year 5, and then every five years for the remaining 15 years or until completion criteria are met (for a minimum of 20 years whichever is longer). The report will summarise the activities implemented under the plan, and discuss the effectiveness of mitigation measures, based on the results of monitoring activities. Reporting will be conducted through internal BMA compliance reporting.

4.1.4 Offset Management Plan structure

A proposed Offset Management Plan will include the following:

- A description of the offset area/s, including location, size, condition, environmental values present and surrounding land uses.
- Details of how the offset area/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the relevant listed threatened species and communities.
- Maps and shapefiles to clearly define the location and boundaries of the offset area/s, accompanied by the offset attributes (e.g. physical address of the offset area/s, coordinates of the boundary points in decimal degrees, the listed threatened species and communities that the environmental offset/s compensates for, and the size of the environmental offset/s in hectares).
- Specific offset completion criteria derived from the site habitat quality to demonstrate the improvement in the quality of habitat in the offset area/s over a 20 year period.
- Details of the management actions, and timeframes for implementation, to be carried out to meet the offset completion criteria.

- Interim milestones that set targets at 5-yearly intervals for progress towards achieving the offset completion criteria
- Details of the nature, timing and frequency of monitoring to inform progress against achieving the 5-yearly interim milestones (the frequency of monitoring must be sufficient to track progress towards each set of milestones, and sufficient to determine whether the offset area/s are likely to achieve those milestones in adequate time to implement all necessary corrective actions).
- Proposed timing for the submission of monitoring reports which provide evidence demonstrating whether the interim milestones have been achieved.
- Timing for the implementation of corrective actions if monitoring activities indicate the interim
 milestones have not been achieved.
- Risk analysis and a risk management and mitigation strategy for all risks to the successful implementation of the OAMP and timely achievement of the offset completion criteria, including a rating of all initial and post-mitigation residual risks in accordance with a risk assessment matrix.
- Evidence of how the management actions and corrective actions take into account relevant approved conservation advices and are consistent with relevant recovery plans and threat abatement plans.
- Details of the legal mechanism for legally securing the proposed offset area/s, such that legal security remains in force over the offset area/s for at least 20 years to provide enduring protection for the offset area/s against development incompatible with conservation.

4.2 Offset delivery

BMA is seeking approval for up to 100 per cent disturbance of significantly impacted MNES within the Project Footprint as a worst case due to uncertainty surrounding final significant residual impacts associated with subsidence from long-wall mining. It is highly unlikely that the Project will result in this extent of impact. As such offsets will be provided in stages.

The staged Project offsets will be provided in advance of each stage. Site specific ground-truthing surveys will be undertaken following clearance to determine the actual level of disturbance and significant residual impact. Monitoring of subsided areas will be conducted on a periodic basis to determine and quantify impacts.

An indicative timeframe for various subsidence-related impacts is presented in Table 6. Any difference between projected and actual significant residual impact will be reconciled when the offset requirement is calculated for the next stage of the Project. Surplus offsets will be accounted for and carried over to the next stage offset requirement. If a surplus in offsets is identified at the end of the Project, this will be reconciled and may be utilised as an advanced offset for future BHP projects.

Table 6 Potential time frames for various impacts on vegetation

Time	Component of longwall mine subsidence	Potential impacts to vegetation
1 month	Roof collapse	Sprouting and tree mortality e.g. forest gap formation and loss of individual trees from slumping and cracking.
1 year	Panel extraction	Phenology e.g. floristic and structural changes in forest canopy.
10 years	Panel succession	Seral stage e.g. Longer-term impacts such as water ponding, potentially leading to an altered progression of woodland community composition and structure.
20 years	Mine completion	Primary-secondary succession e.g. multi-decade change in vegetation community boundaries, from the above impacts and ongoing decommissioning and rehabilitation works.

4.3 Indicative forward milestone dates

Subject to the outcome of overall Project planning activities and owners approval for Project construction commencement, the following indicative milestone dates (Table 7) form the basis for the planning of offset related works to be undertaken in the post EIS pre-construction phases of the Project.

Table 7 Indicative forward milestone dates

Milestone description	Indicative milestone date
Saraji East Mining Lease Project EPBC Act Approval and Environmental Authority approval. Expected conditions to require submission of an Offset Management Plan for the Project with details on Stage 1 offset properties prior to commencement of construction	Project Year 1
Identify suitable candidate offset properties, gain access for investigations to enable ecological assessment documentation plus negotiations to secure use rights over relevant properties.	Project Year 1 to Year 2
Submit Offset Management Plans for approval for Stage 1 properties based on actual properties that are proposed to be used.	At least 12 months before construction commencement
Target for approval of Offset Management Plans	At least 6 months before construction commencement

5.0 Offset availability

5.1 Overview

All offsets delivered by BMA will be compliant with the EPBC Act and EO Act. BMA has progressed a preliminary assessment of offset availability within the Brigalow Belt Bioregion for the maximum predicted significant residual impact. Habitat quality analysis surveys for Project impacts will be undertaken following the finalisation of the EIS and detailed design to confirm offset requirements.

5.2 Offset availability identification methodology

BMA has identified potential offset areas containing degraded vegetation and habitat values with substantial riparian areas and within 1 km of permanent water to enable the offset for MNES and MSES to be stacked.

Estimation of potential offset availability within the bioregion was undertaken using desktop assessment of available remnant, MSES and High Value Regrowth vegetation within the Brigalow Belt Bioregion and criteria that reflect the offset criteria listed in applicable offset guidelines.

Potential offset areas will be preferentially located within the Brigalow Belt North Bioregion located within the Brigalow Belt North Bioregion and Isaac-Comet Downs sub region (for connectivity areas only), same broad vegetation group or regional ecosystem (RE) status and excluding mining and protected area tenure.

Potential offset areas were based on lot and plan rather than properties, which may contain more than one lot. Offsets may be located on several properties due to the requirements of ornamental snake habitat and the brigalow TEC which are substantially different to the remainder of the MNES potentially being impacted.

5.2.1 Limitations of the desktop assessment

The desktop assessment identified limitations, including:

- all desktop identified areas require ground-truthing of environmental values
- potential conflicts may exist between land use areas
- further site-specific habitat quality analyses are required to determine the suitability of the offset and the size of the offset required for each impact
- landholders who own the potential offset areas may not wish their land to be the subject of environmental offsets.

5.3 Offset availability within the region

The analysis of potential offset availability for impacts to MSES and MNES including Regulated Vegetation, TECs and listed threatened species habitat within the Brigalow Belt Bioregion is presented in Table 8.

BMA has identified freehold, leasehold or trust land offering offset potential exceeding the estimated offset requirement for the significant residual impacts of the proposed maximum disturbance from the Project.

As outlined in Table 8, this Strategy demonstrates that a substantial extent of potentially suitable offset areas is available in the region that can be used to acquit significant residual impacts associated with the Project. This available area does not include younger regrowth vegetation that could also be suitable to address the Project's offset requirements. Furthermore, assessment of suitable areas to address MNES offset requirements has been limited to suitable BVGs to address MSES significant residual impacts, with the intent of co-locating offsets. Other suitable BVGs for offsetting MNES are available in the region. Therefore, information presented in the tables below likely underestimate the full extent of available offset areas within the region.

5.0 Offset availability

5.1 Overview

All offsets delivered by BMA will be compliant with the EPBC Act and EO Act. BMA has progressed a preliminary assessment of offset availability within the Brigalow Belt Bioregion for the maximum predicted significant residual impact. Habitat quality analysis surveys for Project impacts will be undertaken following the finalisation of the EIS and detailed design to confirm offset requirements.

5.2 Offset availability identification methodology

BMA has identified potential offset areas containing degraded vegetation and habitat values with substantial riparian areas within 1 km of permanent water to enable the offset for MNES and MSES to be stacked. Offset areas will be preferentially located within the Brigalow Belt North Bioregion and Isaac-Comet Downs sub region (for connectivity areas only), within the same broad vegetation group or regional ecosystem (RE) status and not within mining and protected area tenure.

Estimation of potential offset availability within the bioregion was undertaken using desktop assessment of available remnant, MSES and High Value Regrowth vegetation within the Brigalow Belt Bioregion and criteria that reflect the offset criteria listed in applicable offset guidelines.

Potential offset areas were based on lot and plan rather than properties, which may contain more than one lot. Offsets may be located on several properties due to the requirements of ornamental snake habitat and the brigalow TEC which are substantially different to the remainder of the MNES potentially being impacted.

The desktop assessment identified limitations, including:

- all desktop identified areas require ground-truthing of environmental values
- potential conflicts may exist between land use areas
- further site-specific habitat quality analyses are required to determine the suitability of the offset and the size of the offset required for each impact
- landholders who own the potential offset areas may not wish their land to be the subject of environmental offsets.

5.3 Offset availability within the region

Potential offset availability for impacts to MSES and MNES including Regulated Vegetation, TECs and listed threatened species habitat within the Brigalow Belt Bioregion is presented in Table 8.

BMA has identified five properties (identified as A, B, C, D and E) comprising freehold, leasehold or trust land offering offset potential exceeding the estimated offset requirement for the significant residual impacts of the proposed maximum disturbance from the Project. These properties demonstrate that a substantial extent of potentially suitable offset area is available in the region that can be used to acquit significant residual impacts associated with the Project.

Information presented in Table 8 is likely underestimate the full extent of available offset areas within the region. Potential offset area availability does not include younger regrowth vegetation that could also be suitable to address the Project's offset requirements. Furthermore, assessment of suitable areas to address MNES offset requirements has been limited to suitable BVGs to address MSES significant residual impacts, with the intent of co-locating offsets. Other suitable BVGs for offsetting MNES are available in the region. This available area does not include younger regrowth vegetation that could also be suitable to address the Project's offset requirements.

Table 8 Potential offset availability for maximum predicted significant residual impacts to MNES and MSES

		Area (ha)							
Matter	Status	Maximum	Potential	Potential offset availability by property					
matter	RE/BVG	significant residual impact	offset required	A	В	С	D	E	Total
MNES									
Brigalow TEC	Endangered 25a	246	984	2,658	0	721	1,489	5,458	10,326
Ornamental Snake	Vulnerable 25a	926	3,703	2,658		721	523	8,786	12,688
Koala	Vulnerable 16a, 17a, 25a	163	654	9,780	14,698	7,885	6,661	11,451	50,475
Greater Glider	Vulnerable 16a, 17a	78	313	713	2,276	4,487	3,898	9,808	21,182
Squatter pigeon (southern)	Vulnerable 16a, 17a, 25a	72	314	10,031	17,499	4,788	7,831	12,059	52,208
MSES									
Endangered RE	11.4.8/11.4.9 (25a)	240	959	2,492	0	721	486	4,595	8,294
Of concern RE	11.3.2 (17a)	73	293	472	1,079	502	1,079	1,335	4,467
Regulated vegetation	11.3.2 and 11.5.3 (17a)	24	94	0	2,329	408	394	150	3,281
within defined distance of a watercourse	11.3.25 (16a)	65	260	64	6	290	244	1,071	1,675
Connectivity	All remnant vegetation	1,269	1,296	11,511	3,257	2,232	1,553	9,988	28,541

5.4 Offset site prioritisation

While proposed offset areas will meet the intent of Commonwealth and State offset policies, prioritisation will be given to those areas that contain multiple offset values and are strategically located. Offsets which contain connectivity values, such as those within regional wildlife corridors, will be prioritised to provide a greater enhancement of biodiversity and long term conservation outcomes.

The final availability and ecological suitability will be dependent on both landholder engagement and ecological equivalence, however the results of the above potential offset analysis show that large areas of potentially suitable vegetation occur.

6.0 Conclusion

This Offset Strategy describes how BMA will secure and manage offsets required to compensate for the significant residual impacts of the Project on MNES and MSES as determined by the Queensland EO Act and the Commonwealth EPBC Act EO Policy (2012), and how offset obligations will be acquitted over the life of the Project.

While committed to avoiding and minimising impacts to protected matters and the environment, BMA is seeking approval for up to 100 per cent disturbance of vegetation across the Project Footprint as a predicted maximum significant residual impact due to the uncertainty regarding clearing works and design associated with incidental mine gas drainage and subsidence impacts from long-wall mining.

BMA has assessed the maximum predicted significant residual impact of the Project (Section 3.0) and identified a reasonable approach (Section 4.0) and enough potential offset areas available within the Brigalow Belt Bioregion for all the matters with significant residual impacts (Section 5.0). The results of this desktop assessment have been presented for each MNES and MSES with total available offset area (hectares).

As well as significant residual impact estimates and associated offset availability, BMA's approach to the provision of offsets outlined within Section 4.0, includes details the offset staging process and landholder negotiations. The staged approach allows offsets to be sought for the maximum area of significant residual impact, with reconciliation of actual impacts by field verification to be carried through into the following stages or for future BHP projects as offset credits.

Through direct, land-based offsets, BMA will secure proportional areas for residual impacts to each protected matter and deliver an overall conservation outcome that improves or maintains the ecological condition and viability of populations.

This Offset Strategy has demonstrated that the Project is committed to ensuring the efficient, effective, timely, transparent, proportionate, scientifically robust and reasonable use of offsets to deliver improved environmental outcomes under the EPBC Act EO Policy and EO Act.

Prior to Stage 1, and associated direct construction impacts, the acquittal process to be used to demonstrate that offsets have been provided for existing and future significant residual impacts will be subject to discussion between the DAWE and the DES and subsequent landholder negotiations.

7.0 References

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