MNES Biodiversity Offsets Strategy
EPBC 2019/8485
Lake Vermont Meadowbrook Project




earthtrade

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Prepared for: Bowen Basin Coal Pty Ltd

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Part A: Introduction and Project description

1 Introduction

1.1 Purpose of this document

This document is the Offset Strategy (**OS**) for the Lake Vermont Meadowbrook Project, EPBC 2019/8485. This strategy identifies the proposed offset site, the proposed offset outcomes, quantifies both environmental impact from the project and environment gain from the proposed offset, and on that basis demonstrates that the proposed offset will be adequate to compensate for the Project's environmental impacts.

2 Project description

2.1 Project title

The title of the Project is the Lake Vermont Meadowbrook Project.

The Project provides for the continuation and extension of the Lake Vermont Mine and incorporates the approved Lake Vermont Mine, including existing/approved operations within mining tenements at the Lake Vermont Mine.

2.2 Project location

The project is located approximately 25 kilometres (**km**) north-east of Dysart in Central Queensland (*Figure 1*). Access to the proposed project is available via the Golden Mile Road that runs eastward from Dysart and intersects with the Lake Vermont Coal Mine access road.

The Project represents an extension of mining activities at the existing Lake Vermont Mine and involves underground longwall mining and open cut mining activities and the development of supporting infrastructure. The existing Lake Vermont Mine operates within Mining Lease (**ML**) 70331, ML 70477 and ML 70528 (*Figure 2*) in accordance with Environmental Authority (**EA**) Permit No. EPML00659513.

The Project maximises the use of Bowen Basin Coal owned land and infrastructure at the Lake Vermont Mine to minimise the environmental impacts from additional infrastructure and provide Project efficiencies (*Figure 3*). The proposed Project extension footprint lies within Mineral Development Licence (**MDL**) 303 and MDL 429 held by the proponent. Bowen Basin Coal intends to submit a future Mining Lease Application (**MLA**) over MDL 303 and MDL 429.

2.3 Project objective and rationale

The primary objective of the Project is to develop the metallurgical coal resource to the north and directly adjacent to the Lake Vermont Mining Lease to secure the long-term future of the Lake Vermont Mine.

The Project addresses the forecast reduction in coal production that will occur at the Lake Vermont Mine, by combining output from the existing open cut operations and the Project extension. This will enable total coal production to be maintained at the currently approved output for an extended period (of approximately 20 years) while also increasing the existing mine life by approximately 30 years. The Lake Vermont Mine extracts approximately 11.5 to 12 million tonnes per annum (**Mtpa**) of run-of-mine coal and produces approximately 9 Mtpa of product coal. Production levels at the Lake Vermont Mine will gradually decline from 2021, and sharply

decrease (to approximately 4 Mtpa and less) from 2028 until the end of the mine life (currently scheduled for 2060). The Project will provide approximately 5 Mtpa of additional product coal to augment the reduced open cut output, thereby maintaining production levels at approximately 9 Mtpa from 2028 through to 2048. Following completion of the Project extension in 2048, open cut production at the existing operations will continue to tail off until final mine completion in 2060.

Other key objectives of the Project are:

- to continue to operate profitable mining operations which provide high quality hard coking coal and pulverised coal for injection to export markets
- to maximise recovery of economically mineable coal resources within Bowen Basin Coal's tenements
- to design, construct and operate the expanded mine to minimise impacts on the social and natural environments
- to maximise the use of Bowen Basin Coal owned land and existing infrastructure at the Lake Vermont Mine to minimise the environmental impacts from additional infrastructure and provide Project efficiencies
- to comply with all relevant statutory obligations and continue to improve processes to achieve sound environmental management.

The Project will provide ongoing employment opportunities for workers currently employed at the Lake Vermont Mine and allows Bowen Basin Coal to continue to support local and regional suppliers of the operations, providing additional security and longevity of employment in the region. The Queensland metallurgical coal industry is a significant supplier to international markets, providing the global steel manufacturing industry with high quality hard-coking coal and pulverized coal for injection. In 2019, the Lake Vermont Mine contributed 8.9 Mt to the export market and was ranked as the ninth largest supplier to the export coal market.

The Project is ideally positioned to efficiently meet the market demands for metallurgical coal, having access to the Lake Vermont Mine's existing infrastructure. The Project will maximise the use of this existing infrastructure to minimise environmental impacts from additional infrastructure. Existing infrastructure that will be utilised includes the Lake Vermont Mine coal handling and preparation plant and associated coal handling facilities, train loadout facilities, product coal stockpiles, co-disposal coal reject facilities and other supporting infrastructure.

2.4 Project impacts

Likelihood of Project significant impacts have been assessed within the Terrestrial Ecology Assessment (AARC 2022) in accordance with the *Significant Impact Guidelines 1.1: Matters of National Environmental Significance* (DoE 2013). Significant impacts across all 4 stages of the Project were determined to be likely to the following matters:

- brigalow TEC (7.9 ha)
- poplar box TEC (44.4 ha)
- ornamental snake (207.1 ha)
- koala (109.2 ha)
- greater glider (100.6 ha).

The offsets proposed in this OS address Stage 1 to Stage 3 inclusive.

2.5 Project stages

Project activities causing significant impacts to offset matters will be staged according to the Project schedule. All four Project stages will include direct vegetation clearance and habitat disturbance while Stages 2 and 3 represent underground mining activities which will result in subsidence ponding-related impacts.

2.5.1 Stage 1

Stage 1 of the Project is the construction phase, which commences in Project Year -1 (indicatively 2024) with completion in Project Year 0 (indicatively 2025). Direct disturbance will occur in stage 1 including vegetation removal for the construction of the infrastructure corridor, mine infrastructure area, electricity transmission line and supporting infrastructure.

2.5.2 Stage 2 and 3

Stage 2 represents the mining of the underground longwall panels located south of the main headings (*Figure 3*). Stage 2 of the Project commences in Project Year 1 (indicatively 2026) and runs through to Project Year 8 (indicatively 2033). Stage 3 represents the underground mining of the longwall panels located north of the main headings (*Figure 3*) and involves mining of two laterally located coal seams. Stage 3 of the Project commences in Project Year 8 and runs through to Project Year 23 (indicatively 2048). Stage 2 and 3 involve some vegetation clearance for the construction of subsidence ponding drainage mitigation works as well as an additional access track to support gas drainage activities.

2.5.3 Stage 4

Stage 4 involves the disturbance of vegetation and habitat for the satellite open cut pit potentially commencing in Project Year 20 (indicatively 2045).

Offsets for significant impacts associated with development of Stage 4 will be proposed within a subsequent offset strategy, to mitigate the impacts to MNES contemplated in the EIS. The Stage 4 offset strategy would provide:

- detail of the environmental offset for the stage 4 significant impacts
- justification that the proposed offsets satisfy the requirements of the *EPBC Act Environmental Offsets Policy 2012* (DSEWPaC, 2012b)
- evidence of the offset area connectivity to dispersal habitat and fauna habitat corridors
- the means of legally securing the proposed offset area.

2.6 Approval status of the Project

The proposed action of the Project has been assessed as a controlled action by the Australian Government (DoEE, 2019).[1] The project will require assessment and approval under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**) before it can proceed.

[1] EPBC Approvals register, at http://epbcnotices.environment.gov.au/_entity/annotation/6a57137b-9d11-ea11-8aa6-005056842ad1/a71d58ad-4cba-48b6-8dab-f3091fc31cd5?t=1646170413641

2.7 Where the offsets are proposed to occur

The offset will be located on the same property as the Project, being Lot 102 SP310393, located approximately 25km north-east of Dysart in Central Queensland. Access is available via the Golden Mile Road that runs eastward from Dysart and intersects with the Lake Vermont Coal Mine access road (*Figure 2*).

Figure 1: Regional location of the Project

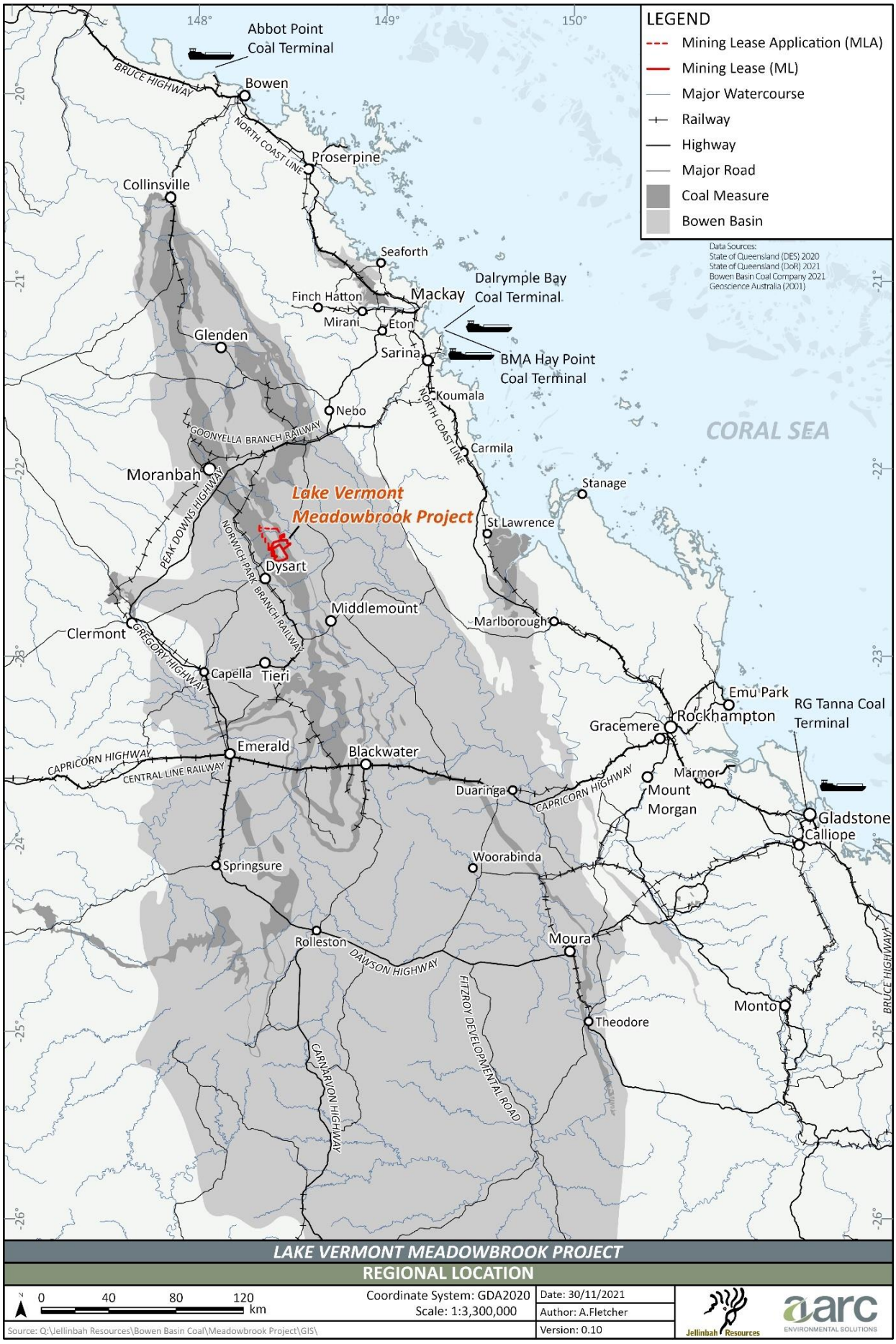


Figure 2: Project location

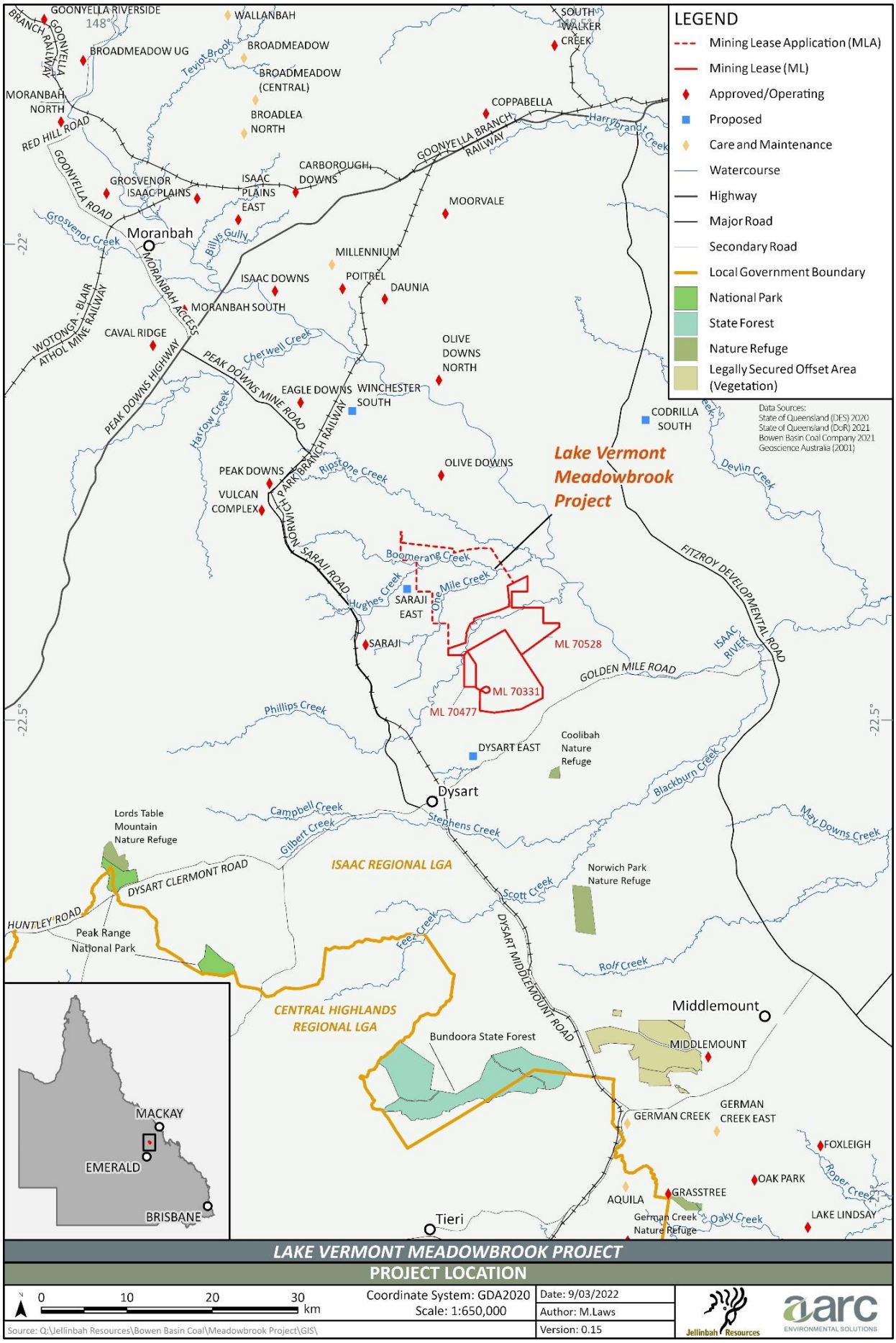
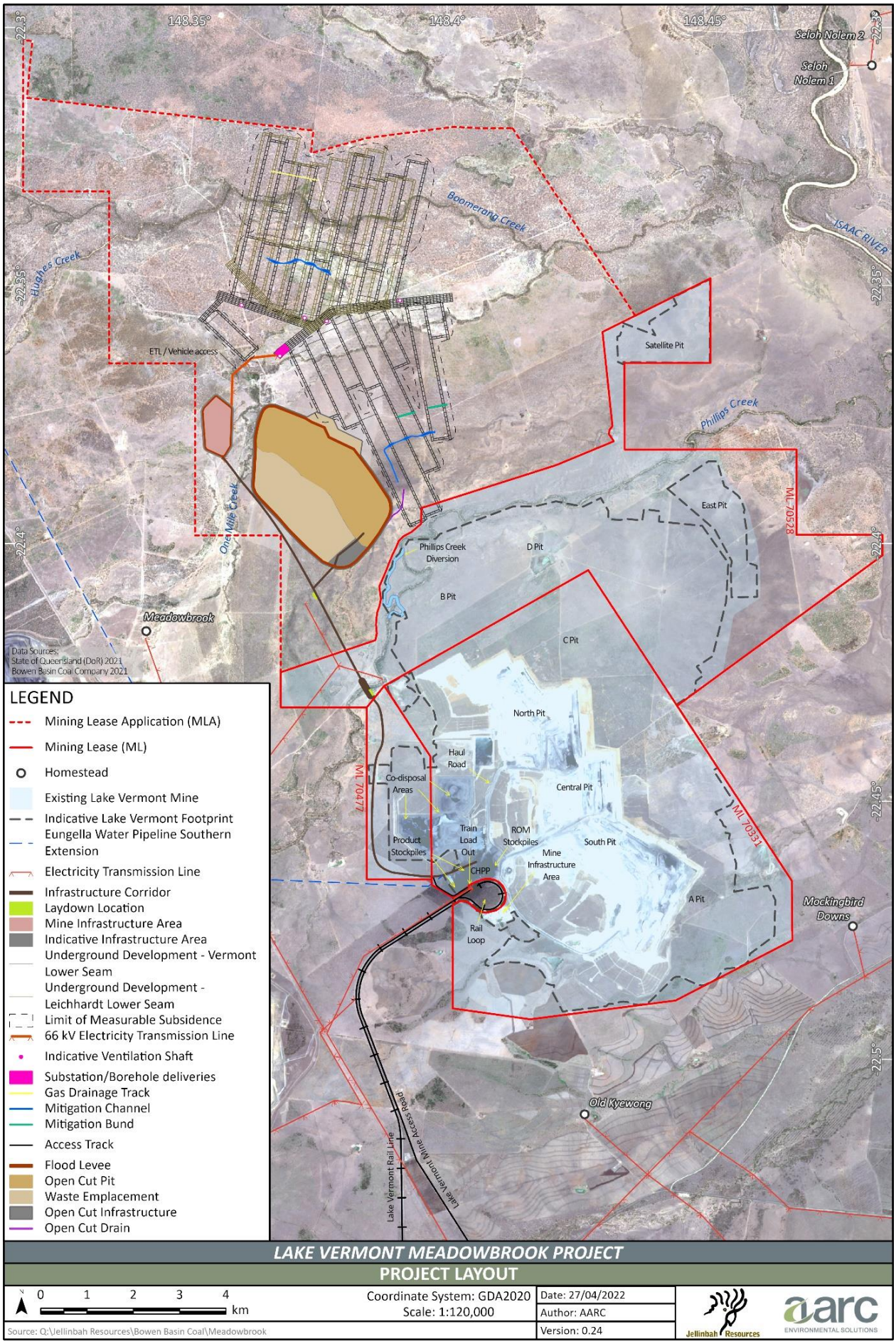


Figure 3: Project layout



2.8 How the proposed offsets meet the requirements of the EPBC Act EOP

The EPBC Act Environmental Offsets Policy (**EOP**) sets out eight key overarching principles to determine the suitability of offsets. The proposed offsets comply with these principles and meet the EOP requirements.

Table 23 in *Section 11* describes in detail how this will be achieved.

3 Impact and offset summary

A summary of the residual significant impacts to matters of national environmental significance (**MNES**) and their associated offsets is shown in *Table 1* below. The impacts to MNES are to threatened ecological communities (**TEC**s) and to habitat for listed fauna species.

Table 1: Impact and offset summary for Stages 1-3

MNES	EPBC status	Impact area Stage 1 (ha)	Impact Area Stage 2 (ha)	Impact Area Stage 3 (ha)	Total Impact area Stages 1-3 (ha)	Impact site quality (/10)	Impact quantum	Offset Area Stage 1	Offset Area Stage 2	Offset Area Stage 3	Total Offset area Stages 1-3 (ha)	Offset start quality (- /10)	Quality without offset (- /10)	Quality with offset (- /10)	Offset quantum and % of liability provided
Acacia harpophylla Brigalow TEC	END	0.6	6.9	0.1	7.6	5.01	3.8	1.82	20.88	0.30	23.0	5.45	5.45	7	102.33%
Eucalyptus populnea Poplar Box TEC	END	0.0	0.0	44.4	44.4	7.14	31.08	0.00	0.00	291.70	291.70	6.53	5.97	8	151.37%
Denisonia maculata Ornamental snake	VUL	37.1	4.6	0.3	42.0	4.10	16.80	81.27	10.08	0.65	92.00	4.64	4.24	7	102.08%
Petauroides volans Greater glider	VUL[1]	4.5	0.0	89.1	93.6	4.96	46.80	17.55	0.00	347.45	365.00	5.69	5.69	7	100.56%
Phascolarctos cinereus Koala	VUL[1]	4.8	8.2	89.1	102.1	5.89	61.2	22.61	38.59	418.80	480.00	5.78	5.78	7	101.13%

** The greater glider EPBC Act listing was upgraded to endangered in July 2022 and koala EPBC listing upgraded in February 2022; however, the Project assessment and approval process is subject to the threatened species listing at the time of the controlled action decision (22 November 2019).*

Part B: Offset Strategy – EPBC 2019/8485

4 Conservation Advice, Recovery Plans, and Threat Abatement Plans

This section describes how this offset strategy addresses the key requirements of Conservation Advice, Recovery Plans, and Threat Abatement Plans relevant to each of the impacted MNES.

Table 2 below summarises the key requirements and recommendations of each document, and references where and how the OS addresses each of these requirements or recommendations.

Table 2: Conservation Advices, Recovery Plans, and Threat Abatement Plans addressed in the OS

Document	Key threats	Section addressed in document
Approved Conservation Advice for the Brigalow (*Acacia harpophylla* dominant and co-dominant) ecological community	**Clearing** The brigalow ecological community was listed as endangered on the basis of extensive clearing. This has altered the ecological community's typical landscape context, with most remnants now occurring as fragments within substantially modified landscapes, or on small clay pans or the toe-slopes of jump-ups and escarpments.	*Section 9.3* - Forestry and native vegetation clearing will not be permitted under the plan. No forestry or timber harvesting activities will be authorised to be undertaken during the period of the declared area. Forestry and native timber harvesting practices in the offset is considered a potential threat to the quality of the vegetation community and habitat due to a reduction in cover and fragmentation of habitat.
	Fire The low density of herbage in most types of brigalow vegetation suggests that fire has been historically rare in the brigalow ecological community. It becomes a serious threat to remnant brigalow where fuel characteristics have been changed (e.g. by the presence of high biomass introduced grass pasture species such as buffel grass. Generally, the most appropriate fire regime for brigalow stands is fire-exclusion (Butler, 2007). It is possible that grazing can be used to manage grass fuel loads. It may also be possible in some cases to develop techniques with cool fires that reduce fuel loads without killing brigalow.	*Section 9.3* - Fire is not permitted in the offset area unless for fuel reduction purposes at no less than seven-year intervals and no more than 30% of the area in any year (this is restricted to the eucalypt areas). Fire is not allowed in the brigalow TEC area.
	Weeds Pest plants can alter the structure and function of brigalow ecosystems and affect their suitability as habitat for native species. Introduced grasses, such as buffel grass, Rhodes grass and green panic grass, pose the greatest threat by drawing fires into the brigalow ecological community and increasing fire severity (Butler, 2007). Particularly vulnerable are fragmented remnants (such as those adjacent to roadsides), patchy regrowth and patches in low rainfall areas.	*Section 9.3* - Pest plants – will be reduced to less than 10% of ground cover. Weed control will be undertaken throughout the offset areas and then periodically, as required, to treat the weeds at the optimum time in their life cycles. The practices will control and minimise the spread of existing weed species.
	Pest animals Feral pigs are probably the most widespread and problematic pest animal in the ecological community, although goats, cane toads, cats and foxes are also serious threats (Butler, 2007). All are responsible for key threatening processes listed as under the EPBC Act.	*Section 9.3* - Feral animals will be monitored and controlled. The management plan will minimise the presence of feral animals and control of existing populations of feral animals (feral cats, dogs and pigs) within the offset areas in accordance with the *Biosecurity Act 2014* (Qld). Monthly inspections will be conducted to record the presence of wallow holes, tracks and visual incidents in the offset area.

Document	Key threats	Section addressed in document
		Upon being notified or becoming aware of the presence of large numbers of feral animals in the offset area, the Landholder is to implement feral animal control measures within one month.
	Climate change The broad environmental tolerance of *Acacia harpophylla* and its associated species gives them some capacity to cope with climate change (Butler, 2007). However, the rate of change is expected to be higher than previously experienced and future climate may differ from that which the Brigalow ecological community was subject to in the past. Furthermore, the landscapes within which the brigalow ecological community faces climate change are radically different from those within which it endured preceding changes and this may compromise adaptability.	*Section 9.3* - Enhance the resilience of the ecological community to the impacts of climate change by relieving other pressures, in particular by implementing management actions regarding vegetation clearance, invasive species and fire (*Section 9.3*)
Approved Conservation Advice (including listing advice) for the Poplar Box Grassy Woodland on Alluvial Plains, Canberra, TSSC, 2019.	**Climate change** Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases.	*Section 9.3* - Enhance the resilience of the ecological community to the impacts of climate change by relieving other pressures, in particular by implementing management actions regarding vegetation clearance, invasive species and fire (*Section 9.3*)
	Land clearing Clearance and fragmentation. Historically mainly from agricultural development and currently includes mining and gas development.	*Section 9.3* - Forestry and native vegetation clearing will not be permitted under the plan. No forestry or timber harvesting activities will be authorised to be undertaken during the period of the declared area. Forestry and native timber harvesting practices in the offset is considered a potential threat to the quality of the vegetation community and habitat due to a reduction in cover and fragmentation of habitat.
	Fire management Fires must be managed to ensure that where possible, prevailing fire regimes do not disrupt the life cycles of the component species of the ecological community, that they support rather than degrade the habitat necessary to the ecological community, that they don't promote invasion of exotic species, and that they do not increase impacts of other disturbances such as grazing or predation by feral predators.	*Section 9.3* - Fire is not permitted in the offset area unless for fuel reduction purposes at no less than seven-year intervals and no more than 30% of the area in any year (this is restricted to the eucalypt areas).
	Pest animals Feral grazing animals can damage native vegetation, and cause land degradation	*Section 9.3* - Feral animals will be monitored and controlled. The offset management plan will minimise the presence of feral animals and control of existing populations of feral animals (feral

Document	Key threats	Section addressed in document
		cats, dogs and pigs) within the offset areas in accordance with the *Biosecurity Act 2014* (Qld). Monthly inspections will be conducted to record the presence of wallow holes, tracks and visual incidents in the offset area. Upon being notified or becoming aware of the presence of large numbers of feral animals in the offset area, the Landholder is to implement feral animal control measures within one month.
	Pest plants Weeds compete with locally indigenous flora species for available resources (water, light, nutrients) and lead to a decline in the diversity and regenerative capacity of native vegetation. For example, weed species impacting diversity in the ground layer of the ecological community include: buffel grass (*Cenchrus ciliaris*) in Queensland.	*Section 9.3* - Pest plants will be reduced to less than 10% of ground cover. Weed control will be undertaken throughout the offset areas and then periodically, as required, to treat the weeds at the optimum time in their life cycles. The practices will control and minimise the spread of existing weed species.
Approved Conservation Advice for *Denisonia maculata* (Ornamental Snake), Canberra: Department of the Environment, 2014.	**Vegetation clearing for cropping and pasture and grazing** The main identified threat to the ornamental snake is a continued legacy of past broadscale land clearing and habitat degradation.	*Section 9.3* - Forestry and native vegetation clearing will not be permitted under the management plan. No forestry or timber harvesting activities will be authorised to be undertaken during the period of the declared area. Forestry and native timber harvesting practices in the offset is considered a potential threat to the quality of the vegetation community and habitat due to a reduction in cover and fragmentation of habitat.
	Destruction of wetland habitat by feral pigs Destruction of wetland habitat by feral pigs (*Sus scrofa*) is also a threat, along with the associated destruction of frog habitat and direct competition for their food source (frogs) (WWF-Australia/QMDC, 2008).	*Section 9.3* - Feral animals – monitoring and control will be undertaken. The presence of feral animals will be monitored and control of existing populations of feral animals (feral cats, dogs and pigs) will be undertaken within the offset areas in accordance with the *Biosecurity Act 2014* (Qld).
Approved Conservation Advice for *Petauroides volans (Greater Glider)*, Canberra: Department of the Environment, 2016.	**Habitat loss (through clearing, clearfell logging and the destruction of senescent trees due to prescribed burning) and fragmentation** The species is absent from cleared areas and has little dispersal ability to move between fragments through cleared areas; low reproductive output and susceptibility to disturbance ensures low viability in small remnants.	*Section 9.3* - Forestry and native vegetation - clearing is not allowed under the management plan. No forestry or timber harvesting activities are to be conducted during the period of the declared area. Forestry and native timber harvesting practices in the offset area remove large trees that provide shelter and food and may also contain hollows and deadwood. It is therefore considered a potential threat to the quality of the habitat.

Document	Key threats	Section addressed in document
	Too intense or frequent fires Population loss or declines documented in and after high intensity fires (Lindenmayer et al., 2013). Studies show that hot, unplanned fires are a main threat to greater glider habitat through increased mortality due to overheating and loss of hollows.	*Section 9.3* - Fire is not permitted in the offset area unless for fuel reduction purposes, at no less than seven-year intervals and no more than 30% of the area at any one time (as per Queensland Department of Environment and Science (**DES**) regional ecosystem descriptions fire management guidelines). Fuel reduction burns will be used as a last resort, and if utilised will be planned to be low intensity with no canopy scorch, with the aim to reduce fuel load in the ground cover layer. This practice aims to prevent unplanned high intensity burns that result from a build-up of fuel.
	Timber production Prime habitat coincides largely with areas suitable for logging; the species is highly dependent on forest connectivity and large mature trees. Glider populations could be maintained post-logging if 40% of the original tree basal area is left (Kavanagh 2000). There is a progressive decline in numbers of hollow-bearing trees in production forests as logging rotations become shorter and as dead stags collapse (Ross 1999; Ball et al., 1999)	*Section 9.3* - forestry and native vegetation clearing is not permitted by the plan. No forestry or timber harvesting activities are to occur during the period of the declared area. Forestry and native timber harvesting practices in the offset area remove large trees that provide shelter and food and may also contain hollows and deadwood. It is therefore considered a potential threat to the quality of the vegetation community and habitat.
	Climate change Biophysical modelling indicates a severe range contraction for the northern subspecies (Kearney et al., 2010). Occupancy modelling indicates that the degree of site occupancy is associated with vegetation lushness and terrain wetness (Lumsden et al., 2013). Water stress affects growth in forest eucalypts (Matusick at al., 2013) and the availability of browse, and higher temperatures may cause heat stress and mortality (Vic SAC 2015).	For the contribution to biodiversity corridors and connectivity – Refer to *Section 8.2*. The offset site was selected for its potential to provide a substantial increase to the habitat, connectivity and other ecological values within the surrounding area. The area is currently composed of degraded tracts of regulated vegetation. Protecting these eucalypt forests from native timber harvesting and fire will add significant value to the area by improving the condition of the koala and greater glider habitat. Additionally, the offset will assist in landscape connectivity and context by improving the existing regulated vegetation along waterways and drainage channels and connecting to the adjacent property.
	Barbed wire fencing (entanglement). There are occasional losses of individuals.	Fencing – internal fencing is not proposed in the offset area. Fencing will be external to the offset; however, the exact location of internal fencing, if required for the riparian area, will be proposed in the Offset Area Management Plan (**OAMP**).

Document	Key threats	Section addressed in document
	Hyper-predation by owls The greater glider forms a significant part of the powerful owl's diet (Bilney et al., 2006).	Refer to the contribution to biodiversity corridors and connectivity - *Section 8.2.* No timber harvesting is permitted and there will be general enhancement of habitat quality to support greater glider population.
Approved Conservation Advice for *Phascolarctos cinereus* (Koala), Canberra: Department of the Environment, 2012. Threatened Species Scientific Committee (TSSC) (2012). Listing advice for *Phascolarctos cinereus* (Koala). Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/197-listing-advice.pdf. In effect under the EPBC Act from 2 May 2012.	**Vegetation clearing for cropping and pasture and grazing** Land clearing was a significant cause of mortality to koalas, particularly in the Brigalow Belt Bioregion (Cogger et al. 2003). Habitat fragmentation may also impede post-drought recovery of koala populations.	*Section 9.3* - Forestry and native vegetation - clearing is not permitted under the plan. No forestry or timber harvesting activities will be undertaken during the period of the declared area. Forestry and native timber harvesting practices in the offset area is considered a potential threat to the quality of the vegetation community and habitat due to a reduction in cover and fragmentation of habitat.
	Vehicle strike Dogs and cars are threats to koalas that are closely associated with urban expansion, with exposure to both increasing as land adjacent to koala habitat is developed and occupied. However, while these threats are most intense in the urban and peri-urban environment, they may be threats in rural areas (Crowther et al. 2010; Senate Environment and Communications References Committee 2011).	*Section 9.3* - Access to the offset area will be restricted. Illegal access is not allowed and access will be managed by the landowner. Monthly inspections will identify if fences are operational and preventing cattle and unauthorised people from accessing the offset area. Access to the offset areas is restricted to the land managers. The offset areas are contained on the back portions of the property and there are no public access points to the offset areas. There is no known treatment for disease which is prevalent in the populations naturally. The establishment of the offset area, increasing the extent and condition of the habitat, may act to reduce some of the environmental stresses that are thought to accentuate the diseases.
	Disease The most well-known disease present in koala populations until recently is associated with chlamydia (Natural Resource Management Ministerial Council 2010). Many koalas carry chlamydia, but do not always show clinical symptoms (known as chlamydiosis). There is circumstantial evidence that chlamydiosis might increase in response to environmental stresses such as overcrowding and poor nutrition (Melzer et al. 2000 and references therein), although the epidemiology of chlamydiosis is not well understood. Koala Retrovirus (**KoRV)** was recently identified and is thought to be responsible for a range of conditions, including leukaemia (Tarlinton et al. 2005) and an immunodeficiency syndrome. Up to 100% of koalas in Queensland and NSW have KoRV. There is some evidence that chlamydiosis may be exacerbated by KoRV (Tarlinton et al. 2005). Koala Retrovirus has endogenised in koalas (Tarlinton et al. 2006) in Queensland and New South Wales. That is, it has infected germ line cells (spermatozoa or oocytes) and is transmitted genetically (by inheritance) from parents to offspring. Although this is a known mechanism of	

Document	Key threats	Section addressed in document
	transmission, KoRV may also spread from koala to koala (horizontal spread) by close contact, and from infected mothers to their joeys via the milk, in a manner similar to the way that many other retroviruses spread (Hanger 1999). Whether KoRV can be transmitted by biting insects has yet to be determined.	
	Predation by dogs Dogs and cats are threats to koalas that are closely associated with urban expansion, with exposure to both increasing as land adjacent to koala habitat is developed and occupied. However, while these threats are most intense in the urban and peri-urban environment, both may also be threats in rural areas (Crowther et al. 2010; Senate Environment and Communications References Committee 2011).	*Section 9.3* - Feral animals will be monitored and controlled. The plan will minimise the presence of feral animals and control of existing populations of feral animals (feral cats, dogs and pigs) within the offset areas in accordance with the *Biosecurity Act 2014* (Qld). Monthly inspections will be conducted to record the presence of wallow holes, tracks and visual incidents in the offset area. Upon being notified or becoming aware of the presence of large numbers of feral animals in the offset area, the Landholder is to implement feral animal control measures within one month.
Threat Abatement Plan (**TAP**) for predation by the European red fox Australian Government, 2008	Predation by foxes (applies to each fauna species)	Major damage to the environment/habitat occurs when large numbers of animals congregate in the area. Management of pest animals is discussed in *Section 9.3*
TAP for competition and land degradation by rabbits. Australian Government, 2016	Presence of rabbits (applies to each fauna species and brigalow TEC)	
TAP for predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*). Australian Government, 2017.	Presence of wild pigs (applies to each fauna species and brigalow TEC)	
TAP for disease in natural ecosystems caused by *Phytophthora cinnamomi*	Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*) (applies to the poplar box TEC)	See *Section 9.3*. Management actions over the offset area are designed to minimise soil disturbance, and to prevent weed invasion and control existing weed species.

5 Survey methodology

Offset matter habitat quality was assessed at proposed impact and offset areas at the Project site according to a methodology informed by the Habitat Quality Guide (DES 2020). The assessment methodology is described in Section 5.1 below.

5.1 Field survey

The field survey was conducted between 28 March 2022 and 3 April 2022. The monthly rainfall recorded at the Booroondarra Bureau of Meteorology Station (station number 035109, BOM 2022) for the period preceding the survey is presented in *Table 3*. Total rainfall in the six months prior to the survey (376 mm) was below the long-term mean (476 mm).

Offset matter extents within the Project site were obtained from the habitat assessments conducted within the *Lake Vermont Meadowbrook Terrestrial Ecology Assessment* (AARC 2022). Ground-truthed vegetation mapping as accepted by Queensland Herbarium as a RE map amendment (Queensland Herbarium Reference ABP_MAR_3562, refer AARC 2022) was adopted in this assessment.

Table 3: Rainfall for the period preceding the survey

Monthly rainfall (mm)												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Long- term mean	109.8	102.9	73.1	34.4	34.5	27.9	26.2	19.8	16.0	41.1	56.9	91.9
2021 total	95.7	13.0	194.4	17.2	0.0	21.2	56.4	21.6	6.0	22.8	150.6	79.4
2022 total	58.0	46.6	19.4	-	-	-	-	-	-	-	-	-

5.1.1 Habitat quality plots

Thirteen assessment units (**AU**), representing all vegetation communities impacted by the Project and considered for offset use within the Project site were assessed. A total of 44 habitat quality plots including 20 plots in impact areas and 24 plots in offset areas were surveyed. Impact area plot locations were selected within the proposed disturbance footprints and in areas that best represented the impacted matters. Offset area plot locations were selected based on areas that best represented the AU condition at the Project site and potential use for provision of offset areas. The locations of habitat quality plots are shown in *Figure 4*. The total impact and offset areas of each AU are shown in *Table 4*.

Figure 4: Offset matter habitat quality assessments

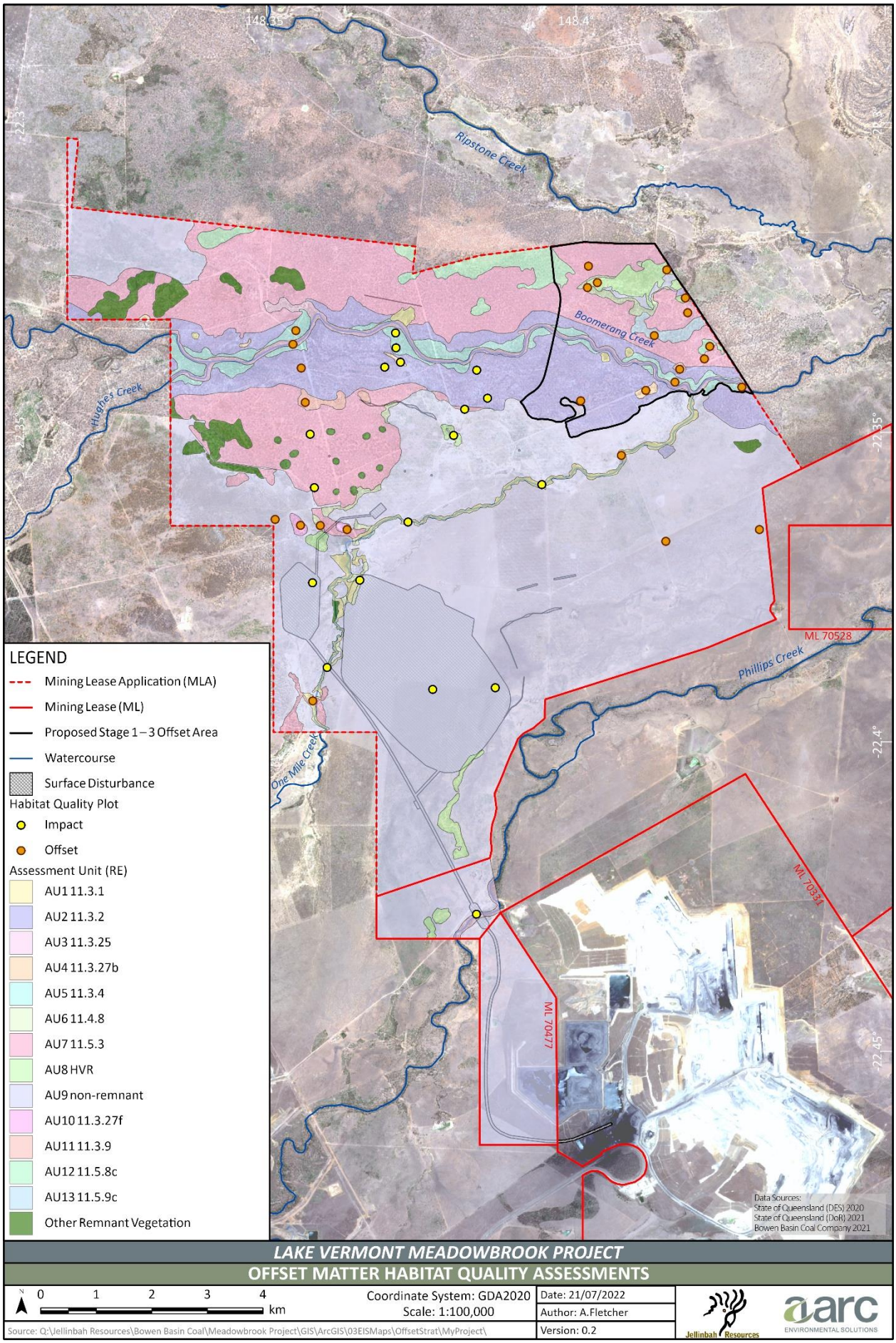


Table 4: Assessment units and habitat quality plots measured

AU	RE	Impact area		Offset area	
		Habitat quality plots	Total significant impact area per AU (ha)	Habitat quality plots	Total undisturbed area per AU (ha)
AU1	11.3.1	4	12.1	2	69.0
AU2	11.3.2	3	58.3	3	589.0
AU3	11.3.25	1	6.8	2	94.0
AU4	11.3.27b	1	2.4	0	8.0
AU5	11.3.4	2	4.9	2	112.0
AU6	11.4.8	0	3.9	2	40.0
AU7	11.5.3	3	20.3	4	1,077.0
AU8	HVR	1	8.4	4	100.0
AU9	non-remnant	3	910.6	3	3,580.0
AU10	11.3.27f	0	0.1	1	11.0
AU11	11.3.9	0	0.3	1	12.3
AU12	11.5.8c	0	0.0	2	94.2
AU13	11.5.9c	0	0.0	0	30.0

5.1.2 Biocondition site-based attributes assessment

Habitat quality and vegetation condition data was collected at habitat quality plots in accordance with the *Guide to determining terrestrial habitat quality* (DES 2020). The site-based attributes of habitat quality plots were described according to the Queensland Herbarium *Biocondition Condition Assessment Framework for Terrestrial Biodiversity in Queensland Version 2.2*. (Eyre et al. 2015). Ecological condition for each habitat quality plot was derived according to DES (2020) with comparison against reference site biocondition benchmarks (DES 2019). The attribute scores contributed to the biocondition scores according to weightings described in Eyre et al. (2020). The attributes assessed at each plot were as follows:

- 100 m transect
    - Tree canopy cover
    - Tree sub-canopy cover
    - Native shrub cover
    - Photographs at each transect end
- 100 m x 50 m plot
    - Number of large eucalypt trees
    - Number of large non-eucalypt trees
    - Tree canopy height – median canopy height (m)
    - Recruitment of canopy species – proportion of dominant canopy species that are regenerating (%)
    - Native tree species richness – number of species present
- 50 m x 20 m plot
    - Coarse woody debris – length of all logs >10 cm diameter and 0.5 m in length
- 50 m x 10 m plot

    - Native shrub, grass and forbs/other species richness
    - Non-native plant cover – cover of exotic species as a component of the overall vegetation cover (%)
- 1 m x 1 m quadrats
    - Native perennial grass cover (%)
    - Organic litter cover (%)
    - Native forbs and other species (%)
    - Native shrubs (<1 m in height) (%)
    - Non-native grass (%)
    - Non-native forbs and shrubs (%)

5.1.3 Landscape context attributes assessment

Landscape scale attributes were assessed for each plot according to the *Biocondition Assessment Manual* (Eyre et al. 2015). The assessment addressed the size of patch, context and connectivity of the habitat quality plots and contributed to the biocondition score according to the weightings described in Eyre et al. (2015).

5.1.4 Species habitat attributes assessment

Species habitat attributes were derived from habitat assessments conducted within the *Lake Vermont Meadowbrook Terrestrial Ecology Assessment* (AARC 2022) and information within the relevant conservation advice.

5.2 Impact area

5.2.1 Flora

The Project is located within the Brigalow Belt North Bioregion, which is known to contain brigalow (*Acacia harpophylla*) woodlands and other TECs. A number of regional ecosystems (**RE**s) mapped by the Queensland Government within the study area were identified as having the potential to represent the brigalow TEC, namely:

- RE 11.3.1 *Acacia harpophylla* and/or *Casuarina cristata* open forest on alluvial plains
- RE 11.4.8 *Eucalyptus cambageana* woodland to open forest with *Acacia harpophylla* or *A. argyrodendron* on Cainozoic clay plains
- RE 11.4.9 *Acacia harpophylla* shrubby woodland with *Terminalia oblongata* on Cainozoic clay plains.

Queensland Government mapping showed one mapped RE with the potential to represent the poplar box (*Eucalyptus populnea*) grassy woodlands on alluvial plains TEC, being RE 11.3.2 (*Eucalyptus populnea* woodland on alluvial plains).

The desktop assessment indicated the brigalow and poplar box TECs have been identified during surveys undertaken by nearby and surrounding projects and was highly likely to occur within the study area.

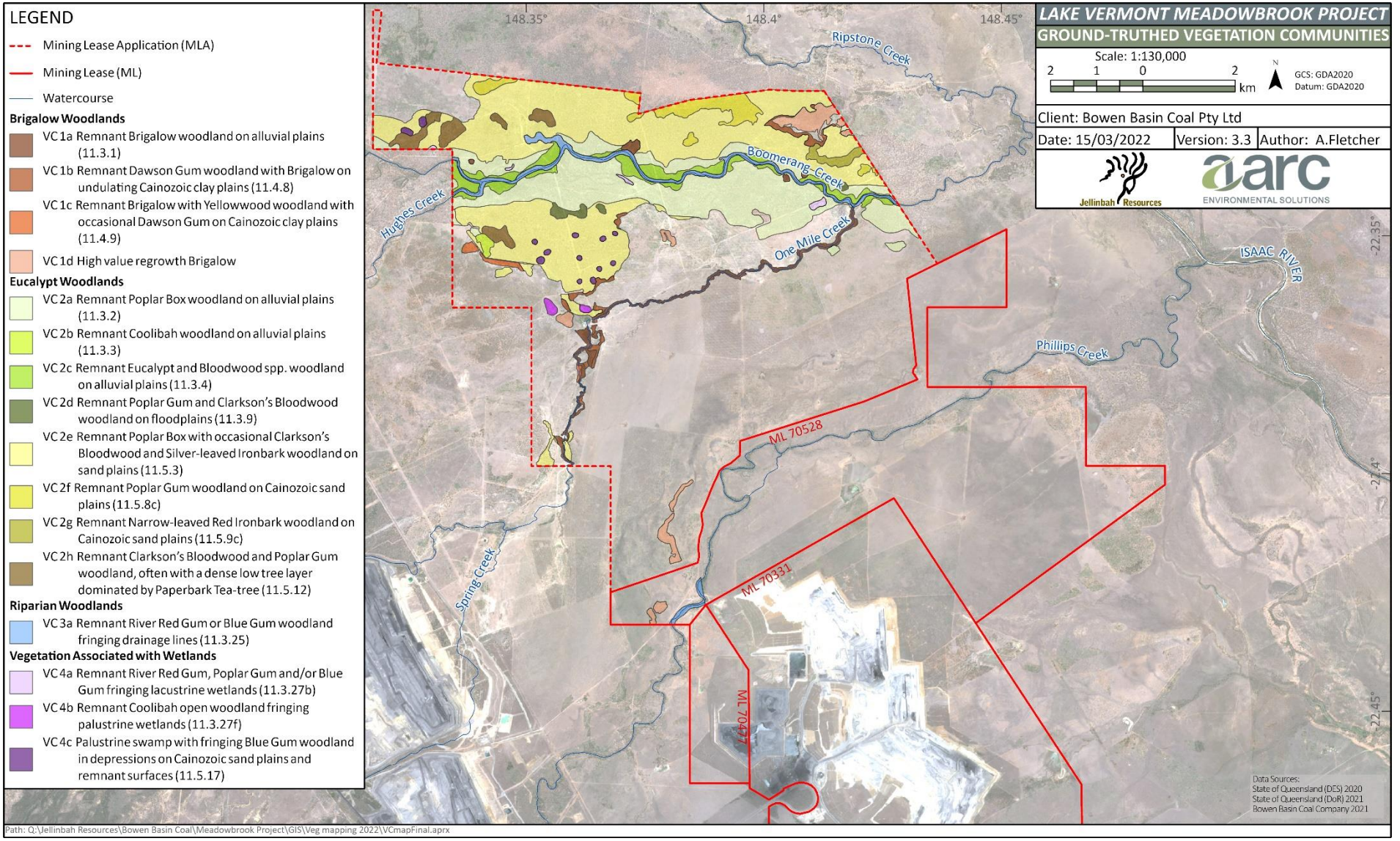
Terrestrial flora and fauna surveys were conducted by AARC for the Project in autumn 2019 (11-21 March), spring 2019 (6-19 November), autumn 2020 (23-25 March and 1-8 April) and autumn 2021 (16-25 April). Vegetation communities within the study area were mapped and described in accordance with the *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland (V5.0)* (Neldner et al. 2019) (*Figure 5*). This included 751 quaternary sites and 54 secondary survey sites. Vegetation community boundaries were validated in the field

using a GPS and refined using the latest aerial imagery available for the study area to produce a ground verified vegetation map.

Brigalow vegetation within the study area was assessed against the key diagnostic characteristics and condition thresholds described in the EPBC approved conservation advice to determine whether the vegetation community met the brigalow TEC status.

Poplar box vegetation within the study area was assessed against the key diagnostic characteristics and condition thresholds described in the EPBC approved conservation advice to determine whether the vegetation community met the poplar box TEC status.

Figure 5: Ground-truthed REs at the Project site



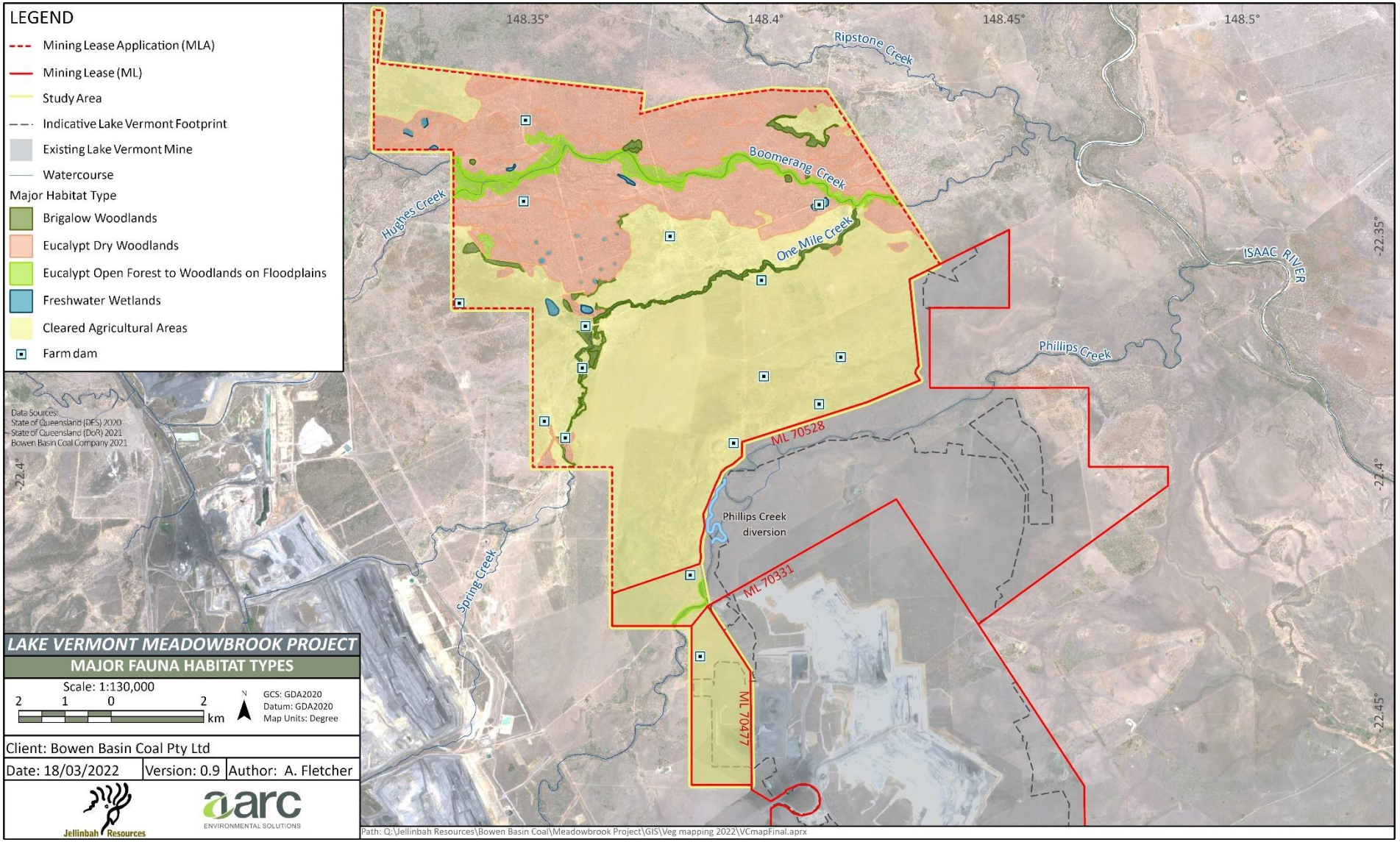
5.2.2 Fauna

Desktop analysis of relevant databases was conducted to determine records of each of the subject fauna species within the vicinity of the Project, including Wildlife Online, Queensland Museum, WildNet and Atlas of Living Australia occurrence records. The desktop assessment also included review of ecological survey and assessments for nearby developments for information/records relating to each species.

Desktop analysis of Queensland government mapping including regional ecosystem mapping, essential habitat mapping, land zone mapping and wetlands was also conducted to determine the potential vegetation communities and soil types present and the extent of potentially suitable habitat for each of the fauna species. Aerial photography was also inspected to assess the presence of potentially suitable habitat features. The major fauna habitat types are shown in *Figure 6*.

Seasonal fauna surveys of the study area were conducted in autumn 2019 (11-21 March), spring 2019 (6-19 November), autumn 2020 (23-25 March and 1-8 April) and autumn 2021 (16-25 April) over 45 days in consideration of relevant Commonwealth and Queensland surveys guidelines for each of the subject fauna species.

Figure 6: Fauna habitat types at the offset sites



6 Impact area description

The Project area is located within the Bowen Basin of Central Queensland, within a local landscape dominated by flat to gently undulating grazing land. Ground elevations range between 160 m and 190 m Australian Height Datum (**AHD**).

Significant landforms within the greater region with higher elevations include Coxens Peak (415 m AHD) located approximately 14 km to the north-east, Walkers Peak (438 m AHD) located approximately 15 km to the south-west and Campbell Peak (430 m AHD) approximately 26 km to the south-west. Harrow Range occurs approximately 17 km to the west.

The Project is traversed by watercourses that flow in an easterly direction to the Isaac River. Hughes Creek (a fourth order stream), Boomerang Creek (a fifth order stream) and One Mile Creek (a third order stream), flow into the Project area from the west and south-west through the neighbouring BMA leases (Saraji Mine, Saraji East Project). The confluence of Hughes Creek with Boomerang Creek occurs in the west of the Project, with One Mile Creek flowing into Boomerang Creek in the east of the Project. These streams are defined as watercourses under the *Water Act 2000* (Qld).

6.1 Known and potential MNES at the impact site

The ecology assessment undertaken by AARC Environmental Solutions between 2019 and 2021 (refer to *Attachment 1A*) included desktop assessment and field survey work to determine the presence and potential presence of MNES at the Project site. Appendix A4 and Appendix A5 of the AARC report detail the likelihood of occurrence of flora and fauna species of conservation significance.

6.2 Impact area – brigalow TEC

Four ground-truthed vegetation communities associated with brigalow woodlands were mapped within the study area and are shown in *Figure 5*

Patches of brigalow vegetation within the Project footprint were assessed as meeting the key diagnostic characteristics and condition thresholds to represent the Brigalow TEC. This included:

- 7.3 ha of remnant brigalow woodland on alluvial plains (VC 1a)
- 0.6 ha of remnant Dawson gum woodland with brigalow on undulating Cainozoic clay plains (VC 1b).

The quantity of significant impact of each of these patches of vegetation assessed in accordance with the Commonwealth *Significant Impact Guidelines 1.1 MNES* (AARC 2022) are detailed in *Table 5*, and shown in *Figure 7*.

Table 5: Impacts to brigalow TEC

Stage	RE	Assessment Unit	Map unit	Area of significant impact (ha)	Total area of significant impact (ha)
S1	11.3.1	1	VC1a	0.3	
	11.4.8	6	VC1b	0.3	0.6
S2	11.3.1	1	VC1a	6.9	6.9
S3	11.4.8	6	VC1b	0.1	0.1
				Total for Stages 1, 2 and 3:	**7.6**
S4	11.3.1	1	VC1a	0.1	
	11.4.8	6	VC1b	0.2	0.3
				Total for Stages 1, 2, 3 and 4:	**7.9**

6.3 Impact area – poplar box TEC

Within the study area only one vegetation community was found to contain areas consistent with the key diagnostic characteristics of the poplar box TEC, namely, the remnant poplar box woodland on alluvial plains vegetation community (VC2a). The majority of this vegetation community met the structure requirements for this TEC and its condition was assessed as Class B, good quality.

The quantity of significant impact of each of these patches of vegetation assessed in accordance with the Commonwealth *Significant Impact Guidelines 1.1 MNES* (AARC 2022) is detailed in *Table 6*, and shown in *Figure 8* below.

Table 6: Impacts to poplar box TEC

Stage	RE	Assessment Unit	Map unit	Area of significant impact (ha)	Total area of significant impact (ha)
S3	11.3.2	2	VC2a	44.4	44.4
				Total for Stages 1, 2, 3 and 4:	**44.4**

Figure 7: Impacts to brigalow TEC

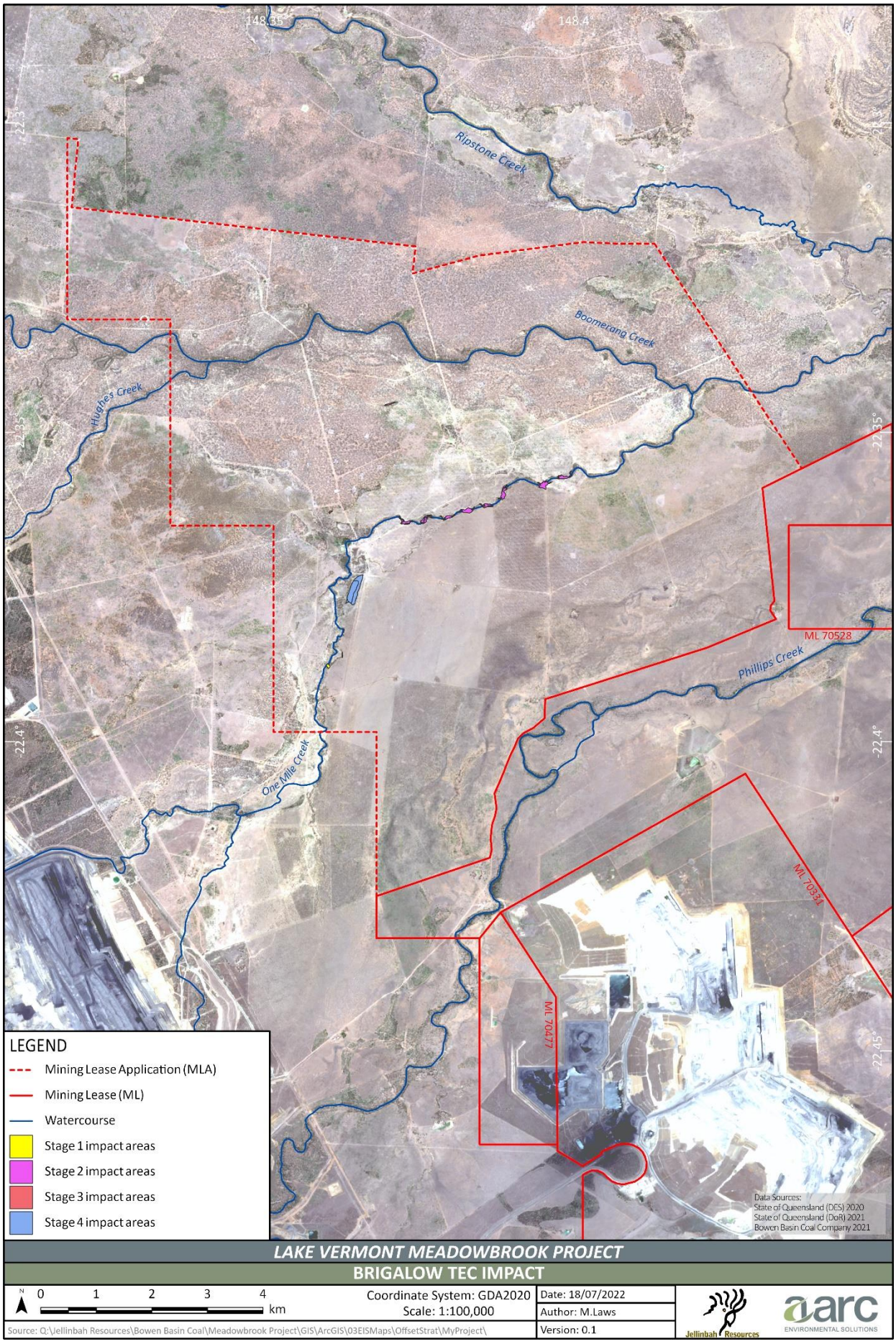


Figure 8: Impacts to poplar box TEC

6.4 Impact area – ornamental snake habitat

The ornamental snake occurs within woodlands and open forests associated with moist areas, particularly gilgai (melon-hole) mounds and depressions in RE land zone 4, but also lake margins and wetlands (DAWE 2021. These habitats are favoured by frogs (the ornamental snake's prey) and provide suitable microhabitat features for the species such as deep cracking clay soils, logs and vegetation debris/litter, in which the species shelters.

The ornamental snake has most commonly been recorded in RE 11.4.3 and is commonly recorded in RE 11.4.6, RE 11.4.8 and RE 11.4.9, and less commonly in RE 11.3.3 and RE 11.5.6 (DAWE 2021a, DSEWPC 2011a). The ornamental snake also occurs in cleared areas where the REs listed above formerly occurred and which comprise adequate ground cover to provide shelter (such as gilgai formations, logs, rocks and other debris) for the species. Gilgai formations are found where deep-cracking alluvial soils with high clay contents occur.

The desktop assessment indicated that the ornamental snake has been identified during surveys undertaken by surrounding projects including, but not limited to, Isaac Downs, Isaac Plains East, Olive Downs Coking Coal Project, Saraji Mine/Saraji East Mining Lease Project and Winchester South Project.

Seasonal fauna surveys of the study area were conducted in autumn 2019 (11-21 March), spring 2019 (6-19 November), autumn 2020 (23-25 March and 1-8 April) and autumn 2021 (16-25 April) over 45 days in consideration of relevant Commonwealth and Queensland surveys guidelines.

The field surveys undertaken in autumn were conducted during optimal climatic conditions for the ornamental snake. In total 14 systematic survey sites were established during the surveys. Three systematic survey sites were established brigalow woodlands on clay soils which is potential habitat for the ornamental snake. Each site consisted of the recommended design and trap numbers for pitfalls and funnels as per the Queensland guideline (Eyre et al. 2018). Supplementary targeted survey effort was conducted in autumn 2021.

Survey effort for the ornamental snake at systematic and targeted sites included:

- Pitfall traps: 176 trap nights
- Funnel traps: 264 trap nights
- Diurnal searches: 75 person hours
- Camera trapping: 56 trap nights
- Spotlighting: 47 per hours in total, with 15 person hours over 3 nights in brigalow and gilgai habitat

The ornamental snake was recorded at three locations within the study area by the terrestrial fauna surveys. All three records were recorded within brigalow regrowth vegetation containing well-developed gilgai.

The quantity of significant impact to ornamental snake habitat assessed in accordance with the Commonwealth *Significant Impact Guidelines 1.1 MNES* (AARC 2022) is detailed in *Table 7*, and shown in *Figure 9.* The significant impacts of Stages 1 to 3 are predominantly in cleared agricultural areas with non-remnant vegetation.

Table 7: Impacts to ornamental snake habitat

Stage	RE	Assessment Unit	Map unit	Area of significant impact (ha)	Total area of significant impact (ha)
S1	11.3.1	1	VC1a	0.3	
	Non-remnant	9		36.8	37.1
S2	Non-remnant	9		4.6	4.6
S3	Non-remnant	9		0.3	0.3
				Total for Stages 1, 2 and 3:	**42.0**
S4	11.3.1	1	VC1a	0.6	
	11.4.8	6	VC1b	0.1	
	Non-remnant	9		164.6	165.4
				Total for Stages 1, 2, 3 and 4:	**207.2**

6.5 Impact area – greater glider habitat

The greater glider is an arboreal nocturnal marsupial, known to occur in eucalypt-dominated habitats, ranging from low, open forests on the coast to tall forests in the ranges and low woodland westwards of the Dividing Range (TSSC 2016). It is primarily folivorous, with a diet mostly comprising Eucalypt leaves, and occasionally flowers. Preferred habitat consists of taller, montane, moist Eucalypt forests with relatively old trees and abundant hollows. It also favours forests with a diversity of Eucalypt species, due to seasonal variation in its preferred tree species (TSSC 2016a). During the day, this species shelters in tree hollows, with a particular selection for large hollows in large old trees (TSSC 2016a) and requires at least two hollow bearing trees for every 2 ha of suitable forest habitat.

Fauna surveys of the study area were conducted in autumn 2019 (11-21 March), spring 2019 (6-19 November), autumn 2020 (23-25 March and 1-8 April), autumn 2021 (16-25 April) and spring 2021 (6 – 10 September) over 50 days in consideration of relevant Australian and Queensland Government surveys guidelines. All surveys fell within the Brigalow Belt Bioregion recommended survey timing (Eyre et al. 2018).

In total 14 systematic survey sites were established during the surveys. For habitat assessment, amenity surveys were conducted along 100 x 50 metre transects within areas of potentially suitable vegetation. The canopy cover of Myrtaceae eucalypt species (*Eucalyptus*, *Angophora* and *Corymbia*) was recorded using the intercept method (Neldner et al. 2020) and the number of trees with suitable hollows (diameter >20 cm, live or dead) was recorded. Spotlighting along a 500 m transect was undertaken at a subset of these sites to record the number of observed greater glider individuals.

Survey effort for the greater glider at systematic and supplementary sites included:

- Active searches: 75 person hours
- Spotlighting: 58.6 person hours
- Call playback: 11 person hours.

The survey timing, methodology and effort were consistent with the Australian Government guidelines. Stag watch surveys were not applied as spotlighting and call playback at potential den tree areas sufficiently surveyed these areas.

The greater glider was recorded at the Project area in a variety of habitats during the autumn 2019, spring 2019, autumn 2020 and spring 2021 surveys. Targeted spotlighting for the greater glider conducted during the site habitat assessments also recorded the species.

The quantity of significant impact to greater glider habitat assessed in accordance with the Commonwealth *Significant Impact Guidelines 1.1 MNES* (AARC 2022) is detailed in *Table 8*, and shown in *Figure 10*.

Table 8: Impacts to greater glider habitat

Stage	RE	Assessment Unit	Map unit	Area of significant impact (ha)	Total area of significant impact (ha)
S1	11.3.1	1	VC1a	0.3	
	11.3.25	3	VC3a	1.6	
	11.3.27f	10	VC4b	0.1	
	11.5.3	7	VC2e	2.6	4.5
S3	11.3.2	2	VC2a	58.3	
	11.3.25	3	VC3a	5.3	
	11.3.27b	4	VC4a	2.4	
	11.3.4	5	VC2c	4.9	
	11.4.8	6	VC1b	0.4	
	11.5.3	7	VC2e	17.7	89.1
Total for Stages 1, 2 and 3:					**93.6**
S4	11.3.1	1	VC1a	3.6	
	11.4.8	6	VC1b	3.4	7.0
Total for Stages 1, 2, 3 and 4:					**100.6**

6.6 Impact area – koala habitat

The koala is known to occur in temperate to tropical forest, woodland and semi-arid communities, in areas that contain known koala food trees, or shrubland with emergent food trees (DoE 2014). The koala is a leaf-eating specialist that feeds primarily during dawn, dusk or at night (DoE 2014). This species' diet is restricted mainly to *Eucalyptus* species; however, it may also consume foliage of related genera, including *Corymbia*, *Angophora* and *Lophostemon*. Koalas tend to move little under most conditions, changing trees only a few times each day (Ellis et al. 2009). Dispersing individuals, mostly young males, may occasionally cover distances of several kilometres over land with little vegetation (DAWE 2021).

The desktop analysis identified numerous records for the species in the vicinity of the Project. Desktop analysis of Queensland government mapping including regional ecosystem mapping was also conducted to determine the extent of potentially suitable habitat for the koala.

Fauna surveys of the study area were conducted in autumn 2019 (11-21 March), spring 2019 (6-19 November), autumn 2020 (23-25 March and 1-8 April), autumn 2021 (16-25 April) and spring 2021 (6 – 10 September) over 50 days in consideration of relevant Commonwealth and

Queensland surveys guidelines. The spring 2019 survey was conducted during the recommended direct observation period (TSSC 2012a).

In total 14 systematic survey sites were established during the surveys. All habitat types surveyed systematically were considered to provide potential koala habitat.

Survey effort for the koala at systematic and targeted sites included:

- Diurnal searches for koalas and scats: 75 person hours
- Call playback: 11 person hours
- Spotlighting: 58.6 person hours in total
- Camera trapping: 56 trap nights.

The habitat assessment survey comprised twenty 100 x 50 m transects used to assess the availability of suitable Myrtaceae 'eucalypt' trees (species of *Eucalyptus*, *Angophora* and *Corymbia*) within remnant vegetation and high value regrowth vegetation within the study area. The number of Myrtaceae eucalypts with a diameter at breast height of >10 cm was counted along each transect.

Six koala individuals and 3 scats were recorded by the autumn 2019, spring 2019 fauna surveys and spring 2021 habitat assessment survey. The species was observed at systematic trap sites in eucalypt dry woodlands and freshwater wetland habitat and incidentally in remnant vegetation.

The quantity of significant impact to koala habitat assessed in accordance with the Commonwealth *Significant Impact Guidelines 1.1 MNES* (AARC 2022) is detailed in *Table 9*, and shown in *Figure 11*.

Table 9: Impacts to koala habitat

Stage	RE	Assessment Unit	Map unit	Area of significant impact (ha)	Total area of significant impact (ha)
S1	11.3.1	1	VC1a	0.3	
	11.3.25	3	VC3a	1.6	
	11.3.27f	10	VC4b	0.1	
	11.3.9	11	VC2d	0.3	
	11.5.3	7	VC2e	2.6	4.8
S2	11.3.1	1	VC1a	8.2	8.2
S3	11.3.2	2	VC2a	58.3	
	11.3.25	3	VC3a	5.3	
	11.3.27b	4	VC4a	2.4	
	11.3.4	5	VC2c	4.9	
	11.4.8	6	VC1b	0.4	
	11.5.3	7	VC2e	17.7	89.1
Total for Stages 1, 2 and 3:					**102.1**
S4	11.3.1	1	VC1a	3.6	
	11.4.8	6	VC1b	3.5	7.1
Total for Stages 1, 2, 3 and 4:					**109.1**

Figure 9: Impacts to ornamental snake habitat

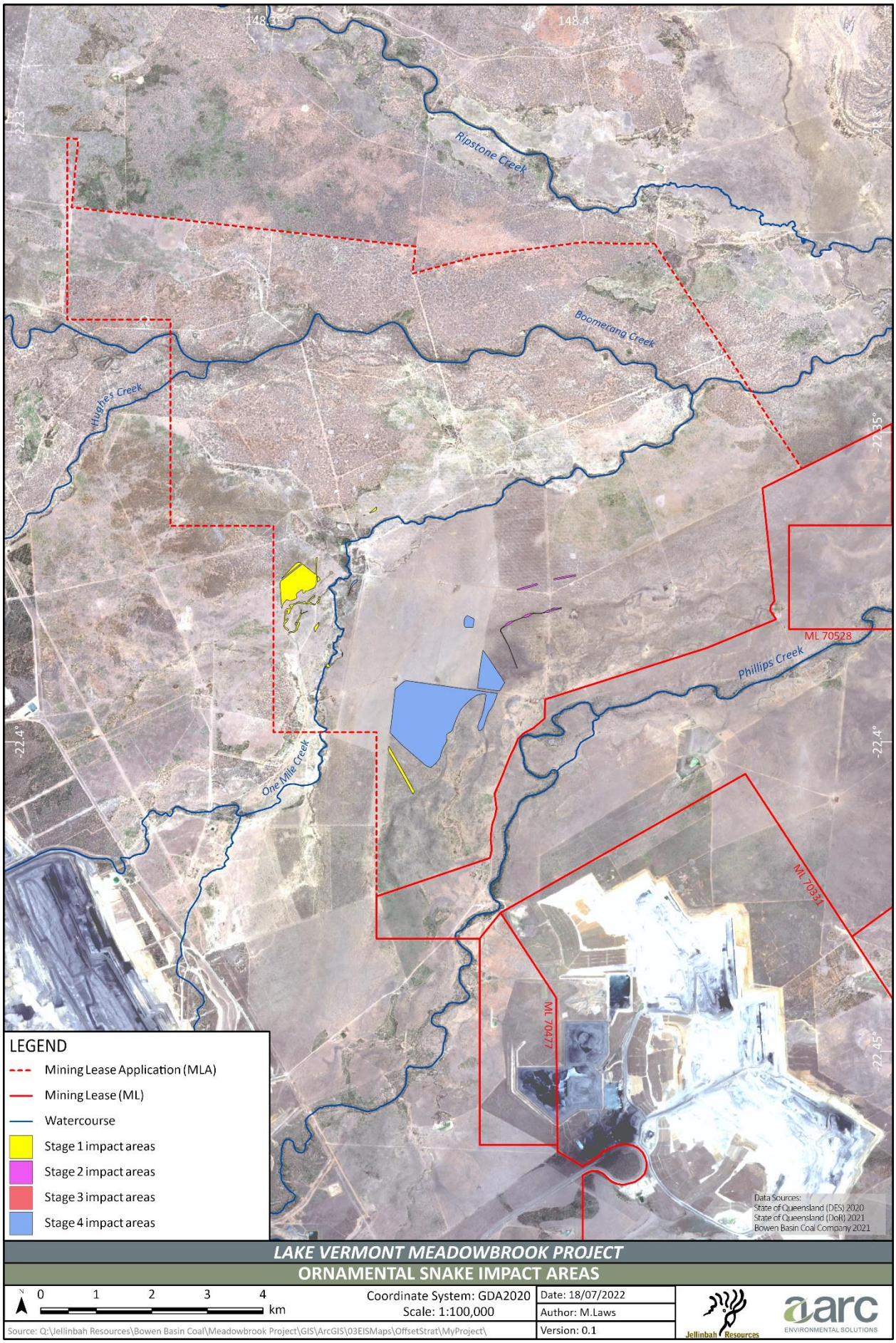


Figure 10: Impacts to greater glider habitat

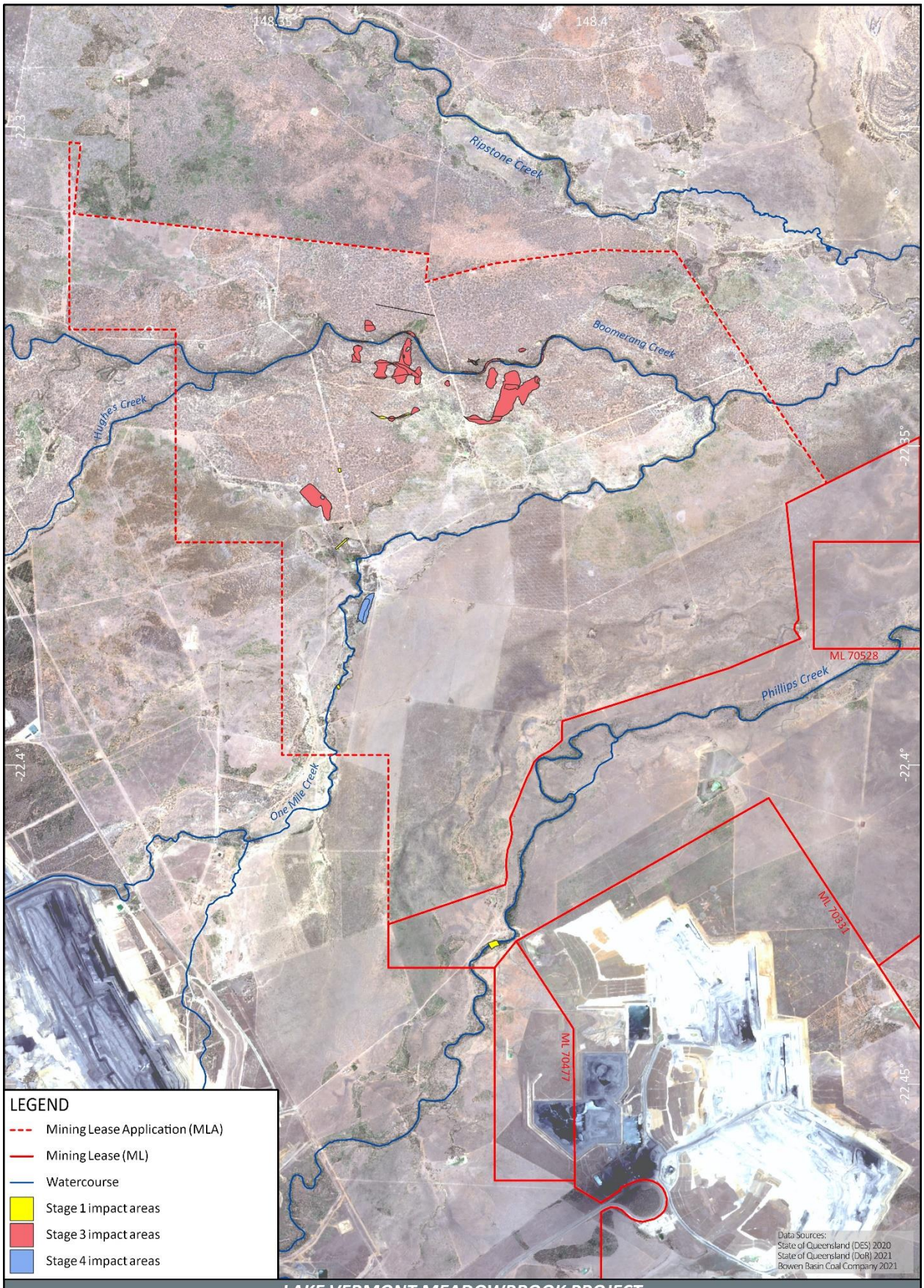
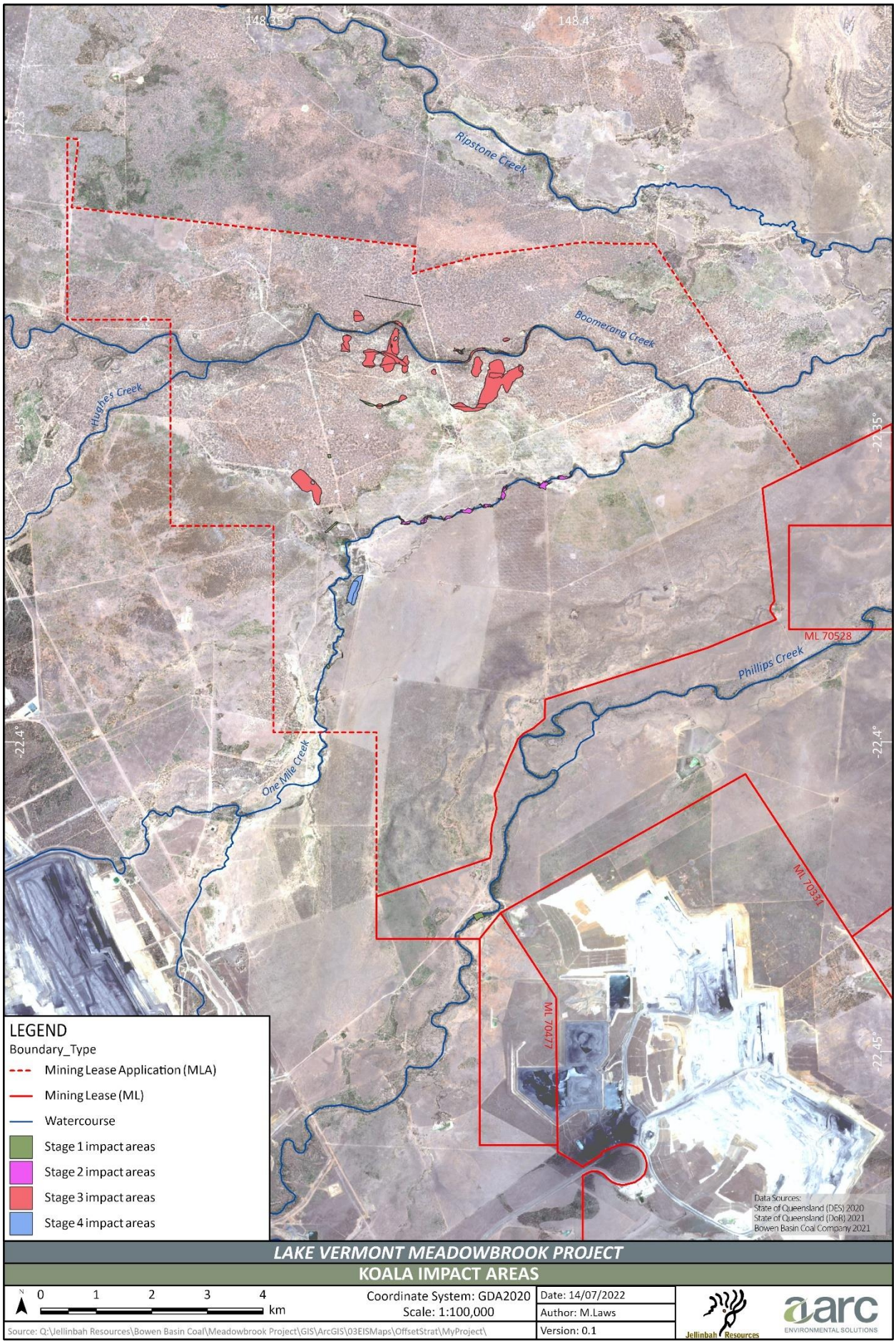


Figure 11: Impacts to koala habitat



7 Impact assessment tables

This section provides summarised habitat quality tables for each of the MNES impacted by the Project Stages 1, 2 and 3. Tables showing the fully detailed habitat quality scores for each assessment site within each AU are provided in *Appendix A*.

Table 10: Brigalow TEC Stage 1, 2 and 3 impact assessment

Assessment units RE	AU1 11.3.1	AU6 11.4.8	
Habitat quality scores (weighted)			**Total:**
Site condition score (-/7)	4.07	3.70	
Site context score (-/3)	0.95	1.10	
Habitat quality score (-/10):	**5.02**	**4.80**	
AU area within impact area (ha)	7.20	0.40	
Total impact area for this MNES (ha)	7.60	7.60	
Area weighting	0.95	0.05	
Weighted habitat quality score:	**4.75**	**0.25**	**5.01**

Table 11: Poplar box TEC Stage 1, 2 and 3 impact assessment

Assessment units RE Habitat quality scores (weighted)	AU2 11.3.2	Total:
Site condition score (-/7)	4.19	
Site context score (-/3)	2.95	
Habitat quality score (-/10):	**7.14**	
AU area within impact area (ha)	44.40	
Total impact area for this MNES (ha)	44.40	
Area weighting	1.00	
Weighted habitat quality score:	**7.14**	**7.14**

Table 12: Ornamental snake habitat Stage 1, 2 and 3 impact assessment

Assessment units RE Habitat quality scores (weighted)	AU1 11.3.1	AU9 non- remnant	Total:
Site condition score (-/3)	1.48	0.83	
Site context score (-/3)	1.62	1.27	
Species stocking rate score (-/4)	2.00	2.00	
Habitat quality score (-/10):	**5.11**	**4.09**	
AU area within impact area (ha)	0.30	41.7	
Total impact area for this MNES (ha)	42.00	42.00	
Area weighting	0.01	0.99	
Weighted habitat quality score:	**0.04**	**4.06**	**4.10**

Table 13: Greater glider habitat Stage 1, 2 and 3 impact assessment

Assessment units RE	AU1 11.3.1	AU4 11.3.27b	AU5 11.3.4	AU3 11.3.25	AU10 11.3.27f	AU7 11.5.3	AU2 11.3.2	AU6 11.4.8	
Habitat quality scores (weighted)									**Total:**
Site condition score (-/3)	1.57	1.73	1.88	1.64	1.85	1.74	1.58	1.15	
Site context score (-/3)	1.17	1.53	1.79	1.47	1.93	1.91	1.55	1.47	
Species stocking rate score (-/4)	2.00	2.00	2.00	2.00	0.00	0.57	2.00	2.00	
Habitat quality score (-/10):	**4.75**	**5.26**	**5.67**	**5.11**	**3.77**	**4.23**	**5.13**	**4.62**	
AU area within impact area (ha)	0.30	2.40	4.90	6.90	0.10	20.30	58.30	0.40	
Total impact area for this MNES (ha)	93.60	93.60	93.60	93.60	93.60	93.60	93.60	93.60	
Area weighting	0.00	0.03	0.05	0.07	0.00	0.22	0.62	0.00	
Weighted habitat quality score:	**0.02**	**0.13**	**0.30**	**0.38**	**0.00**	**0.92**	**3.19**	**0.02**	**4.96**

Table 14: Koala habitat Stage 1, 2 and 3 impact assessment

Assessment units RE	AU1 11.3.1	AU2 11.3.2	AU5 11.3.4	AU3 11.3.25	AU4 11.3.27b	AU6 11.4.8	AU7 11.5.3	AU10 11.3.27f	AU11 11.3.9	
Habitat quality scores (weighted)										**Total:**
Site condition score (-/3)	1.25	1.35	1.63	1.29	1.21	1.07	1.43	1.90	1.64	
Site context score (-/3)	2.60	2.76	3.00	2.81	2.87	2.75	2.99	3.00	2.96	
Species stocking rate score (-/4)	2.00	2.00	2.00	2.00	2.00	2.00	0.57	0.00	0.00	
Habitat quality score (-/10):	**5.85**	**6.12**	**6.63**	**6.09**	**6.08**	**5.83**	**4.98**	**4.90**	**4.60**	
AU area within impact area (ha)	8.50	58.30	4.90	6.90	2.40	0.40	20.30	0.10	0.30	
Total impact area for this MNES (ha)	102.00	102.00	102.00	102.00	102.00	102.00	102.00	102.00	102.00	
Area weighting	0.08	0.57	0.05	0.07	0.02	0.00	0.20	0.00	0.00	
Weighted habitat quality score:	**0.49**	**3.50**	**0.32**	**0.41**	**0.14**	**0.03**	**0.99**	**0.00**	**0.01**	**5.89**

8 Offset site description

8.1 General

The offset is located on 'Meadowbrook' Lot 102 SP310393 which has a total area of 14,531 ha. The property is zoned as rural use and, apart from open cut mining in the south of the property, is largely used for cattle grazing (*Figure 2*). The proposed area for Stage 1 – 3 offsets is a portion of the property owned by the proponent and within the proposed MLA. The area is adjacent to and has connectivity to the proposed Project site.

The property has been extensively cleared and over-sown with buffel grass previously, and this management cycle continues to date.

The topography of the offset area is generally flat to gently undulating, with elevations ranging between 160 m and 190 m AHD and is representative of the surrounding region.

The following land zones (and associated soil types) occur within the offset area:

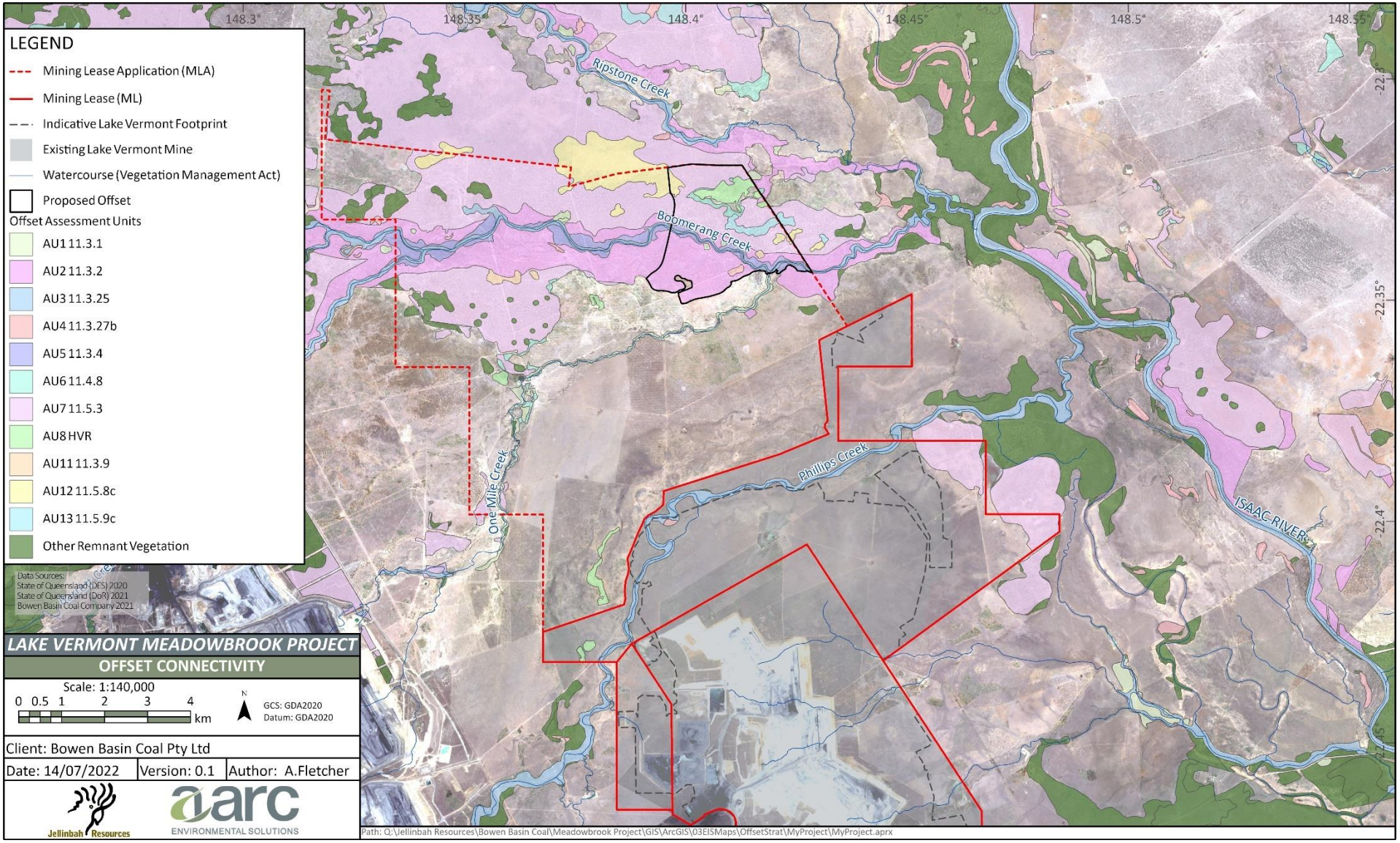
- Land Zone 3: Recent Quaternary alluvial systems, including closed depressions, paleo-estuarine deposits currently under freshwater influence, inland lakes, and associated wave-built lunettes (Wilson and Taylor 2012). Land Zone 3 excludes colluvial deposits such as talus slopes and pediments. This Land Zone includes a diverse range of soils predominantly Vertosols and Sodosols. Land Zone 3 also occurs with Dermosols, Kurosols, Chromosols, Kandosols, Tenosols, Rudosols and Hydrosols; and Organosols in high rainfall areas.
- Land Zone 4: Tertiary-early Quaternary clay deposits, usually forming level to gently undulating plains not related to recent Quaternary alluvial systems. This land zone mainly occurs with Vertosols with gilgai microrelief. Land Zone 4 also includes thin sandy or loamy surfaced Sodosols and Chromosols with the same paleo-clay subsoil deposits.
- Land Zone 5: Tertiary-early Quaternary loamy and sandy plains and plateaus (Wilson and Taylor 2012). Land Zone 5 consists of extensive, uniform near level or gently undulating plains with sandy or loamy soils and includes dissected remnants of these surfaces. Soils are usually Tenosols and Kandosols, also minor deep sandy surfaced Sodosols and Chromosols (Wilson and Taylor 2012).

Water resources are restricted to empirical water holes and flows within Boomerang Creek, Hughes Creek, One Mile Creek and within several farm dams.

8.2 Connectivity of the offset site

Riparian corridors associated with Boomerang Creek, Hughes Creek, One Mile Creek and Phillips Creek provide east–west fauna movement opportunities through the landscape. The riparian vegetation along these streams is mapped as regionally significant (Boomerang Creek, Hughes Creek, One Mile Creek) or state significant (Phillips Creek) corridors connecting to state significant riparian vegetation along the Isaac River (*Figure 12*Figure 12). The riparian corridors associated with these streams provide species with opportunities for movement and dispersal, in particular the koala and greater glider.

Figure 12: Biodiversity and riparian corridors and the offset site



8.3 Known and potential MNES at the Stage 1 – 3 offset site

The proposed offset areas are located on the same property as the Project itself. These potential offset areas were assessed according to the methodology described in *Section 5*.

8.4 Description of vegetation at the Stage 1 – 3 offset site

A general description of the land and vegetation of the offset site is provided in *Section 6* above.

8.4.1 Brigalow TEC at the offset site

The offset area comprises 2 regional ecosystems that are listed in the Conservation Advice and are described below. The contribution of each of the REs is in *Table 15* and the areas of each RE within the proposed offset area is shown in *Figure 13.* Note that the AU8 is high value regrowth (**HVR**) of RE 11.4.8 with an age of circa 8-10 years and will return to remnant status within the offset period of 20 years.

- RE 11.3.1 *Acacia harpophylla* and/or *Casuarina cristata* open forest on alluvial plains
- RE 11.4.8 *Eucalyptus cambageana* woodland to open forest with *Acacia harpophylla* or *A. argyrodendron* on Cainozoic clay plains

Table 15: Brigalow TEC at the offset site

RE	Assessment unit	Map unit	Area of offset (ha)
11.3.1	AU1	VC1a	3.90
HVR (11.4.8)	AU8	HVR	19.10
		Total:	**23.00**
Offset area by stages			
		S1	1.82
		S2	20.88
		S3	0.30
		Total:	**23.00**

8.4.2 Poplar box TEC at the offset site

The entire offset area for the Poplar Box TEC consists of RE 11.3.2 and described as *Eucalyptus populnea* woodland on alluvial plains. The contribution of this RE is in *Table 16* and is shown in *Figure 14*. The offset area has been subject to timber harvesting, ground and shrub layers manipulation for grazing and the over-sowing of exotic pastures.

Table 16: Poplar box TEC at the offset site

RE	Assessment unit	Map unit	Area of offset (ha)
11.3.2	AU2		291.70
		Total:	**291.70**
Offset area by stages			
		S1	-
		S2	-
		S3	291.70
		Total:	**291.70**

Figure 13: Stage 1 – 3 brigalow TEC offset area

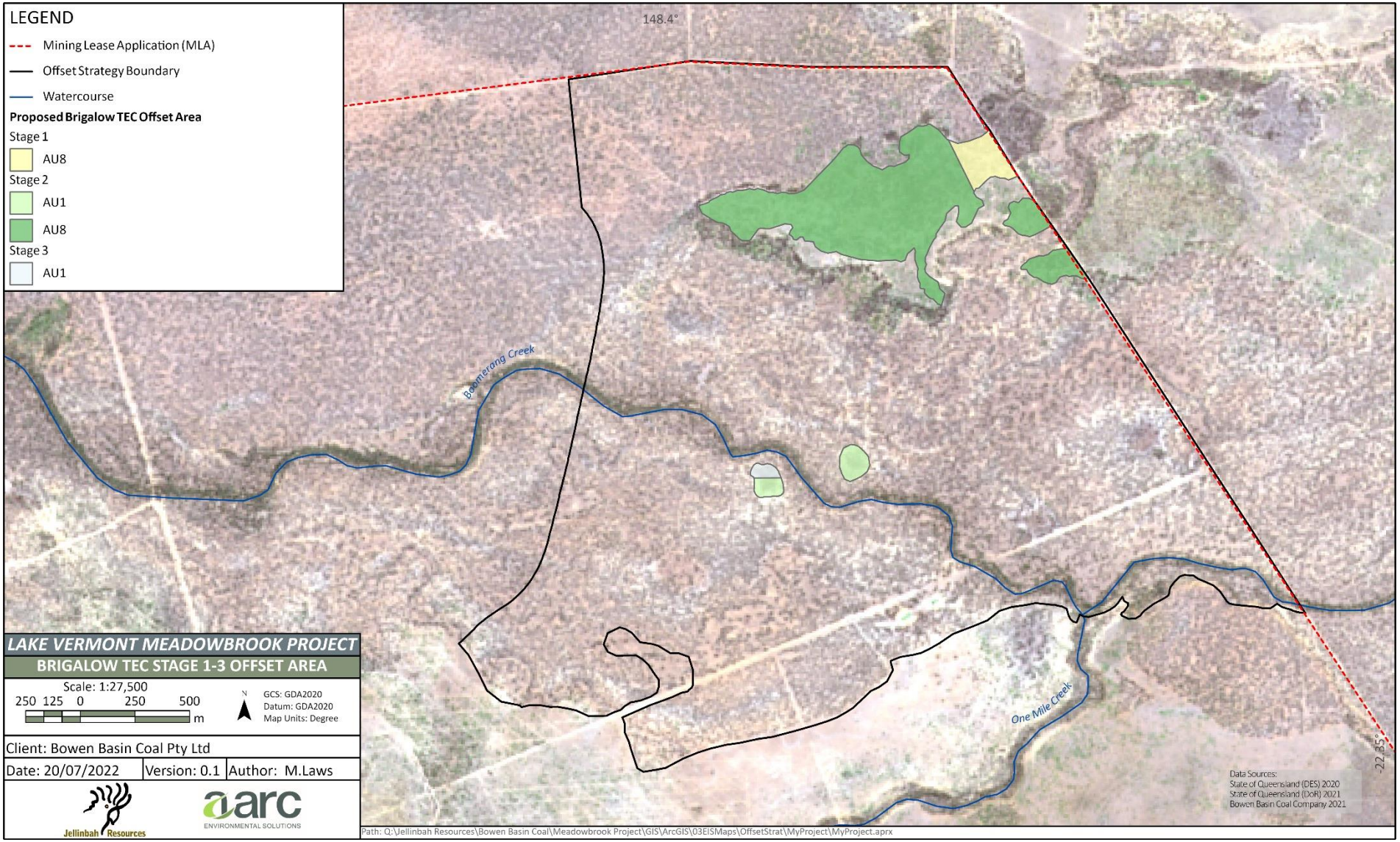
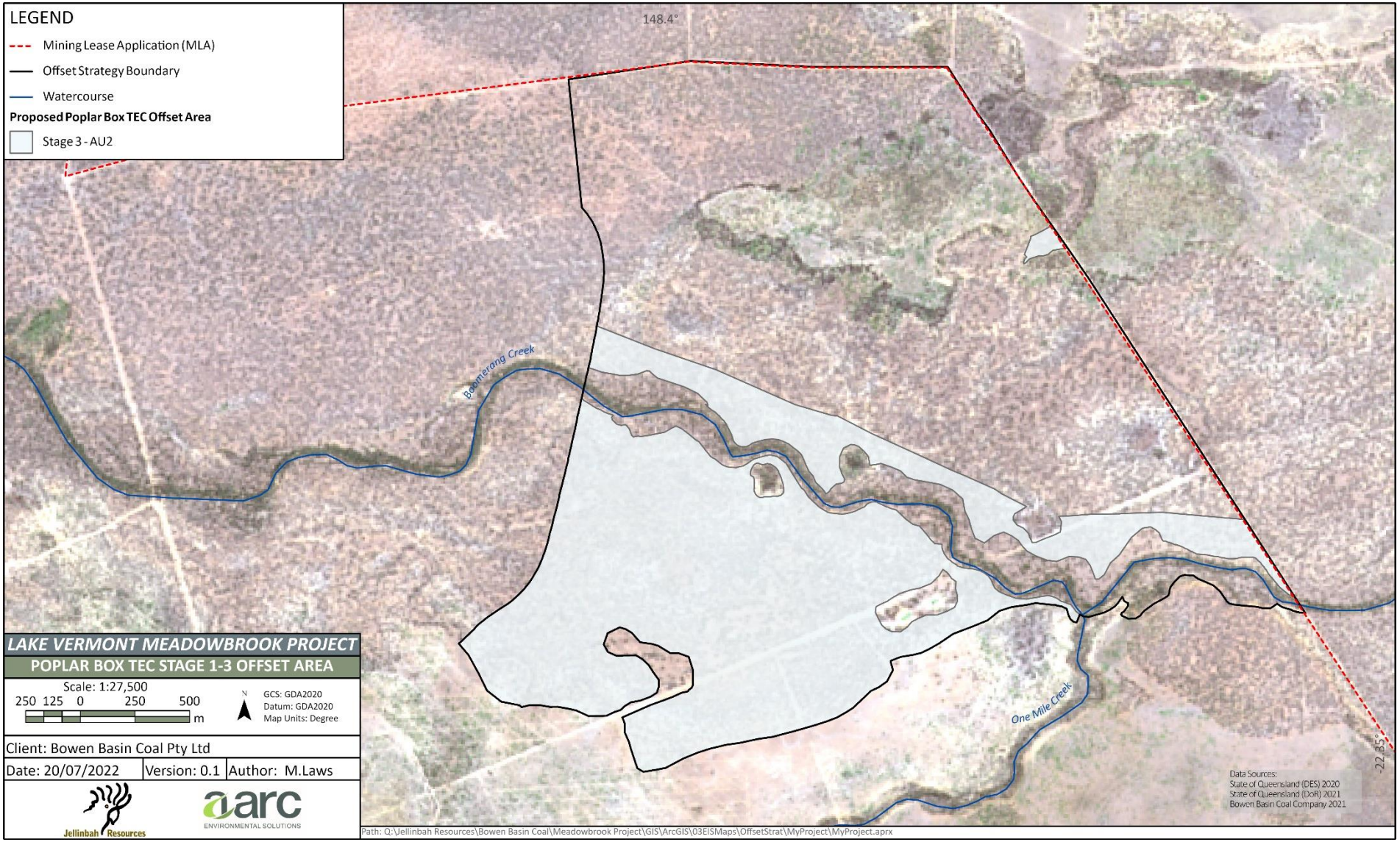


Figure 14: Stage 1 – 3 poplar box TEC offset area



8.4.3 Ornamental snake habitat at the offset site

The offset area for the ornamental snake has been centred on the brigalow TEC areas which support gilgai, and wetland and riparian corridor along Hughes Creek which is a stream order 5. The vegetation along the creek (REs 11.3.25, 11.3.27f and 11.3.1) often hosts ornamental snake due to the proximity to water and hence the primary food source (frogs), and the accumulation of logs and other woody debris on the ground which is used for habitat. The accumulation of woody debris will improve habitat quality and availability and shelter over time. Although 41.7 ha of the stage 1 – 3 significant impacts to ornamental snake occur over cleared agricultural areas, the proposed offset is entirely HVR and remnant vegetation. The offsetting of cleared areas with suitable vegetation represents a materially advantageous offset of the impacts. The contribution of each of the REs to the proposed offset area is in *Table 17* and the areas of each RE within the proposed offset area is shown in *Figure 15*.

Table 17: Ornamental snake habitat at the offset site

RE	Assessment Unit	Map unit	Area of offset (ha)
11.3.1	1	VC1a	3.90
11.3.25	3	VC3a	12.28
11.4.8	6	VC1b	20.30
HVR 11.4.8	8	VC1d	55.52
		Total:	**92.00**
Offset area by stages			
		S1	81.27
		S2	10.08
		S3	0.65
		Total:	**92.00**

8.4.4 Greater glider habitat at the offset site

The offset area for the greater glider is centred on Hughes Creek as the availability of water encourages greater tree growth. All of the REs selected are dominated by eucalypt species that are prone to developing hollows. Poplar box is noted for its tendency for large hollows in the Conservation Advice for the poplar box TEC. The contribution of each of the REs to the proposed offset area is in *Table 18* and the areas of each RE within the offset area is shown in *Figure 16*.

Table 18: Greater glider habitat at the offset site

RE	Assessment Unit	Map unit	Area of offset (ha)
11.3.2	2	VC2a	288.33
11.3.25	3	VC3a	29.09
11.3.27b	4	VC4a	5.76
11.3.4	5	VC2c	38.83
11.3.9	11	VC2d	2.99
		Total:	**365.00**
Offset area by stages			
		S1	17.55
		S2	-
		S3	347.45
		Total:	**365.00**

8.4.5 Koala habitat at the offset site

The koala offset area is also centred on Hughes Creek for the higher moisture trees due to the availability of water, the large eucalypt trees that provide additional shelter, especially in extended hot and dry seasons, and for the availability of preferred feed species. The large, contiguous area of eucalypt-dominated species in all of the REs selected contributes to the value of the site to the species. The contribution of each of the REs to the proposed offset area is in *Table 19* and the areas of each RE within the proposed offset area is shown in *Figure 17*.

Table 19: Koala habitat at the offset site

RE	Assessment Unit	Map unit	Area of offset (ha)
11.3.2	2	VC2a	289.90
11.3.25	3	VC3a	29.09
11.3.27b	4	VC4a	5.76
11.3.4	5	VC2c	38.83
11.3.9	7	VC2d	2.99
11.5.3	11		113.43
		Total:	**480.00**
Offset area by stages			
		S1	22.61
		S2	38.59
		S3	418.80
		Total:	**480.00**

Figure 15: Stage 1 – 3 ornamental snake offset area

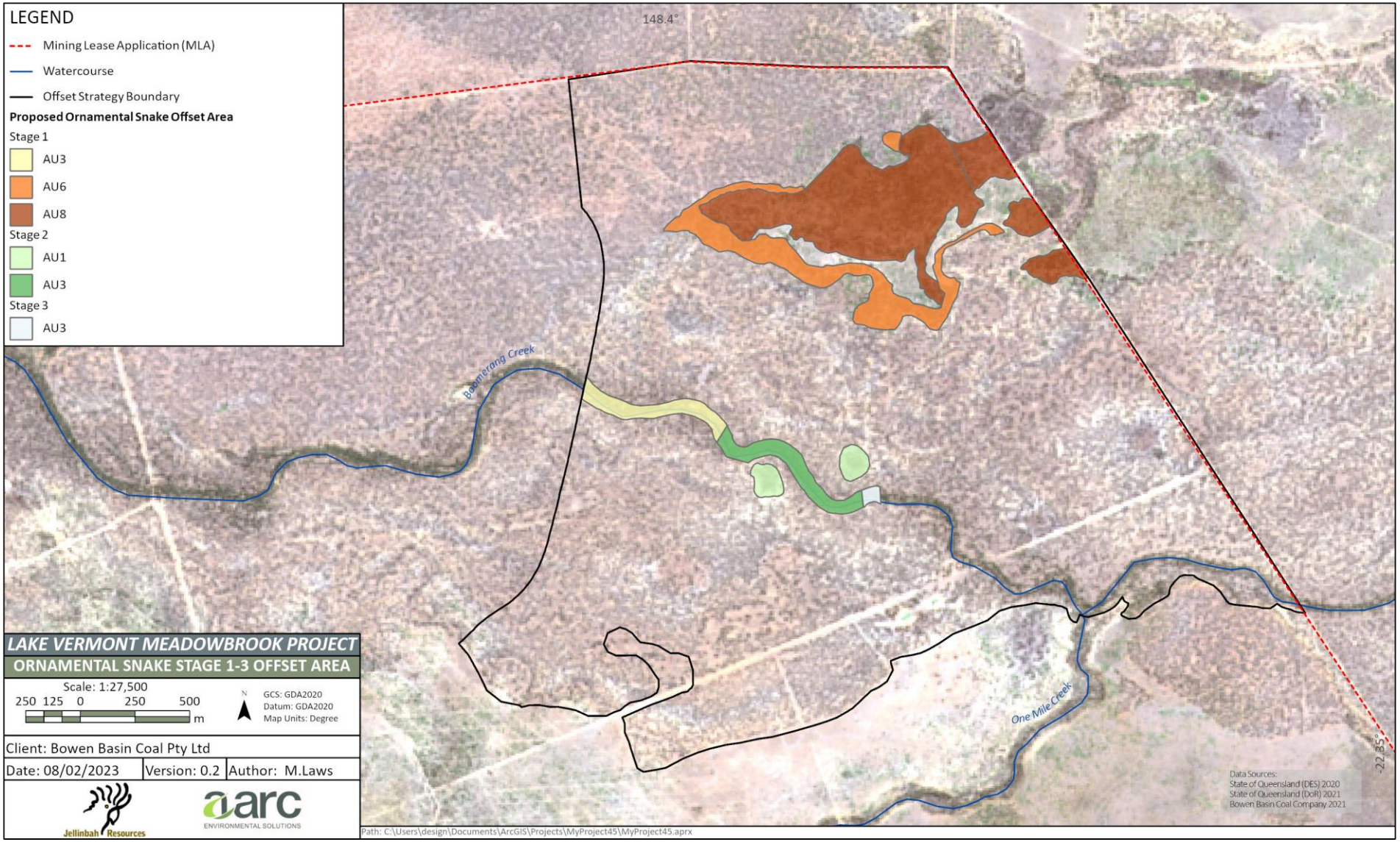


Figure 16: Stage 1 – 3 greater glider offset area

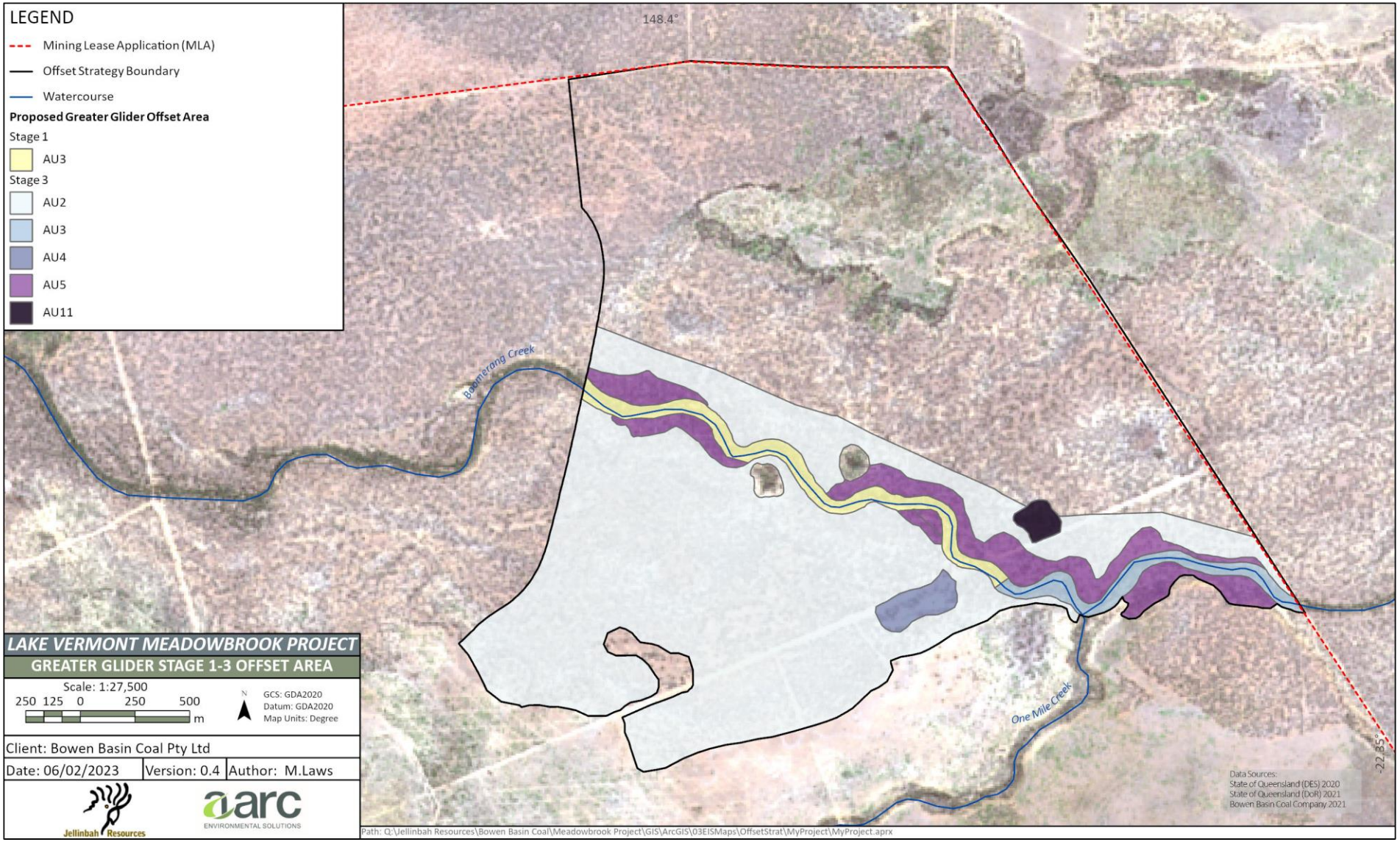
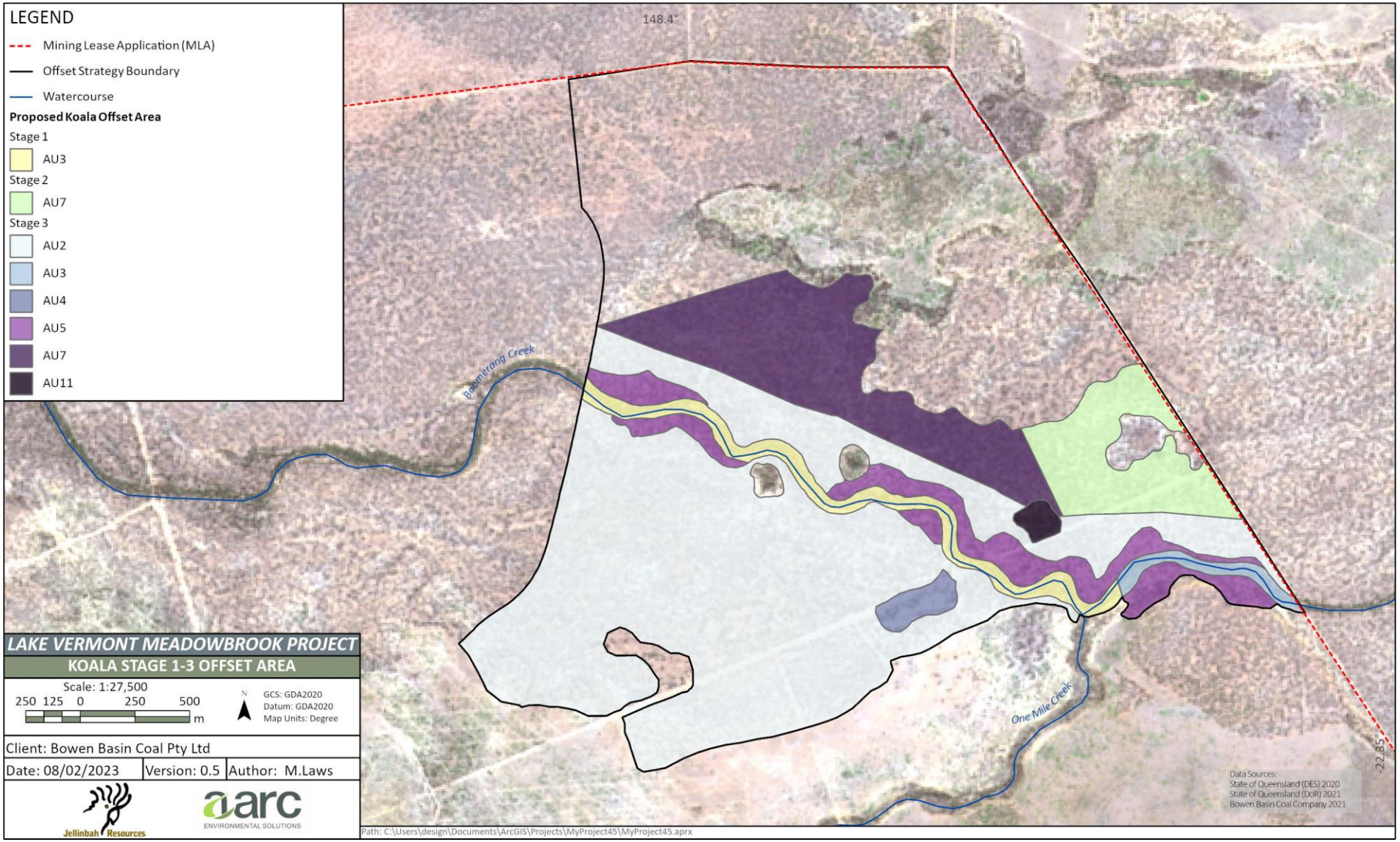


Figure 17: Stage 1 – 3 koala offset area



8.4.6 Stage 1-3 proposed offset area

The proposed offset areas with biocondition and habitat quality sufficient to provide the offsets required for significant impacts for Project Stages 1, 2 and 3 are shown in *Figure 13* to *Figure 17*. Offsets required per Project stage is shown and these offset areas will be secured prior to the start of each respective Project stage and according to the offset timeframes proposed in Section 9.4.

8.4.7 Stage 4 offsets

A separate Offset Strategy for impacts of Stage 4 will be agreed to with DCCEEW at a date not less than 18 months prior to Stage 4 impacts commencing. The Offset Strategy will be accompanied by an OAMP for Stage 4 and the offsets will be secured prior to commencement of that Stage. It is noted that Stage 4 is scheduled for 2045. It is anticipated that the offsets for Stage 4 will be located on the same property (Meadowbrook).

8.5 Current management of the offset site

The offset area is currently used for cattle grazing. The area of brigalow noted as being HVR has been cleared previously with a bulldozer and chain. The eucalypt areas have been harvested for timber. The entire area is used for cattle grazing and has been over-sown with buffel grass.

8.6 Threats currently present at the offset site

Table 40 (see *Section 14*) provides a full analysis of the threats currently present at the offset site. This table shows the ‘initial risk ranking’ which would apply to the offset area if the offset did not proceed; that is, the ‘business as usual’ or ‘without offset’ scenario. The ‘residual risk ranking’ illustrates the risk outcome of the ‘with offset’ scenario, and demonstrates how the offset mitigates or reduces these risks through the execution of offset management actions over the term of the offset.

9 Offset site outcomes

9.1 Site quality without the offset

Vegetation clearing as a native forest practice, or a forest practice; and grazing on the offset site; is not currently prohibited by legal mechanisms at either the local, state or Australian government legislative level.

The area is zoned rural and has been used for timber harvesting and cattle grazing previously. Areas of the offset property have been subject to vegetation clearing since the late 1970s as part of the Brigalow Development Scheme. Clearing of regrowth and the introduction of exotic pasture species such as buffel grass have been ongoing management measures as part of the continued grazing operation on the property.

The landholder has the legal right to continue clearing vegetation in areas mapped as Category X on the property map of assessable vegetation (**PMAV**). Category X areas are those areas of vegetation that are not regulated; i.e., those areas that are not mapped as remnant vegetation, or as high value regrowth vegetation, or as an area subject to compliance notices or offsets.

9.2 Site quality with the offset

Securing the offset area will add additional protection for biodiversity values from clearing[2] and provide additional management of weeds and pest animals that are additional to the general requirements for biosecurity.

The offset area is not protected from timber harvesting, the inappropriate use of hot fires or the under-sowing of exotic pasture species by either the VM Act or the EPBC Act due to exemptions within the legislative frameworks for the continuing use of the land. Remnant vegetation areas are protected from broadscale clearing under the VM Act, however the clearing of regrowth is permitted (see the offsets maps at *Figure 13* to *Figure 17*). Maintaining the existing condition of regulated vegetation and land for habitat values is not addressed under the VM Act.

The management of the offset area will include:

- The use of appropriate fire regimes to enable large trees with hollows to develop
- The use of thinning in the Poplar Box area to encourage large trees with hollows to develop
- Fencing of the offset area into smaller paddocks, which is currently part of a larger paddock, into manageable areas for grazing control
- Water infrastructure will be installed to enable controlled grazing for buffel grass reduction and the control of fuel loads
- Wild pig control programs will be stepped up and
- Fire and grazing regimes will be altered to enable the shrub and sub-canopy layers to develop and to encourage an increase in the species richness for native grasses and forbs.

The *Biosecurity Act 2014* (Qld) (the **Biosecurity Act**) imposes a 'general biosecurity obligation' on all Queenslanders to manage biosecurity risks that are under their control and that they know about or could reasonably be expected to know about.[3] In practical terms, this means that:

- If you are a livestock owner, you are expected to stay informed about pests and diseases that could affect or be carried by your animals, as well as weeds and pest animals that could be on your property. You are also expected to manage them appropriately.
- If you are a landowner, you are expected to stay informed about the weeds and pest animals (such as wild dogs) that could be on your property. You are also expected to manage them appropriately.

The Biosecurity Act assigns the pests identified in the offset areas as Restricted Matters in Categories 3-6 and requires the following management as shown below in *Table 20*.

Table 20: Biosecurity Act 2014 (Qld) obligations

Category	What is required	Examples
3	Must not distribute, be traded or released into the environment	Most invasive weeds, pest animals, noxious fish
4	Must not move	Certain weeds, pest animals, noxious fish such as feral pigs, feral deer, rabbits, Hudson pear and jumping cholla cactus

[2] *Vegetation Management Act 1999* (Schedule definitions)
[3] See https://www.daf.qld.gov.au/business-priorities/biosecurity/policy-legislation-regulation/biosecurity-act-2014/general-biosecurity-obligation

Category	What is required	Examples
5	Must not possess or keep	Rabbits, carp, bunny ears cactus
6	Must not feed (except if undertaking a control program)	Feral deer, wild dogs, rabbits, foxes, noxious fish (tilapia, gambusia)

The obligations in the offset area management plan (**OAMP**) will be additional to these general obligations, in that control will be required once thresholds as detailed in the schedule of offset management actions are met, which initiates the respective controlling actions. For example, there will be a requirement to control wild pigs if numbers in excess of 12 are observed in any one property inspection; this is above and beyond the requirements of the Biosecurity Act, as is the reduction of weed species to 10% of the offset area over the life of the management plan.

The Isaac Regional Council identifies the offset areas as Rural in their planning scheme and offers no protection from the current ongoing land use. The council has a draft Biosecurity Plan which refers landholders to their general biosecurity obligation under the Biosecurity Act.[4]

The improvement in offsets area habitat quality is summarised in *Table 1*. The starting quality and planned future quality habitat scores are provided in detail for each matter in *Table 24* to *Table 38*. The improvements in habitat quality scores are associated with improvements in the site condition as a result of the management actions as listed in *Table 21*. Improvements in site condition will also aid in improving species stocking rates for ornamental snake, koala and greater glider as habitat quality improves over time.

The uplift in habitat quality for the ornamental snake are predominantly associated with improving the vegetation along the creeks (REs 11.3.25, 11.3.27f and 11.3.1) and improving regrowth areas towards remnant vegetation (HVR RE11.4.8) which will improve quality and available of the primary food source (frogs) and the accumulation of logs and other woody debris on the ground which is used for shelter and habitat.

The uplift in habitat quality for poplar box TEC, koala, brigalow TEC and greater glider are predominantly associated with improvements in site condition through the management of non-native plant species, strategic cattle grazing, pest management and improved fire management. Further management measures for poplar box TEC may include ecological thinning which will increase the opportunity for improving native tree, shrub and grass species richness, organic matter and coarse woody debris over shorter timeframes to achieve ten-year targets.

9.3 Offset management actions

The offset area management measures include, but are not limited to, management actions required on the offset site to abate those threats identified to the brigalow TEC, poplar box TEC, ornamental snake, greater glider, and koala. The offset area management measures will provide for the management, reporting, and the monitoring program (*Table 41)* that will be undertaken for the period of EPBC Act approval. Protection of the offset area will be maintained under the VM Act as a Category A area of vegetation (vegetation subject to a restoration order or an offset).

The management actions, as described in Section 9.2 above, are designed to mitigate the risks discussed in *Section 14*, as shown in *Table 21*.

[4] https://www.isaac.qld.gov.au/downloads/file/2042/draft-isaac-region-biosecurity-plan

Table 21: Management measures

Management measures	Risks addressed by the management measure
Limiting vegetation clearing	• Prevents unapproved or unintentional clearing within the offset area, except for clearing associated with fence lines, fire breaks and public safety • Maintains and improves the value of habitat within the offset areas • Reduces erosion • Ecological thinning may be carried out in RE 11.3.2 and 11.5.3, but only on and in accordance with the advice of a Principal Ecologist with >15 years' experience in Central Queensland.[5]
Prohibiting alternate land uses; e.g. timber harvesting, cropping	• Access controls and fencing prevent timber harvesting • As the offset will be a declared area under the VM Act, there are legislative barriers to alternate land uses such as cropping
Restricting unauthorised access	• Prevents timber harvesting and recreational uses such as camping • Minimises the spread of weeds and pathogens • Prevents unplanned access by livestock
Controlled grazing	• Prevents degradation of habitat by overgrazing, including erosion. Grazing times to avoid the wet season and maintain minimum dry matter yields (ground cover) • Manages fuel load by reducing dry matter yield to levels that reduce the risk of a hot fire (when required to reduce the fuel load to an acceptable level which will be detailed in the OAMP) • Increases the richness and cover of native perennial grasses by timing grazing to enable the native grasses to set seed and to avoid overgrazing
Control of feral animals	• Minimises damage to the environment and habitat when large numbers of feral animals congregate in the area • Minimises predation of native fauna species by feral animals
Managing fire	• Reduces the risk of uncontrolled fire (reduction in fuel loads by controlled grazing) resulting in the destruction of regrowth and slowing the offset site in achieving the completion criteria • Restricted use of controlled ecological burns may assist in maintaining ground cover and minimising erosion • Reduces the risk of uncontrolled fire in directly affecting native fauna species • Reduction of non-native grasses will reduce the fuel load and therefore the risk of uncontrolled hot fires.[6]

[5] When too many immature native trees are present, this decreases the ability of the trees to reach full height and width. See section 5 of *Natural Values Health Checks A guide to undertaking health checks for key natural values Version 1.6* (July 2019). Ecological Assessment Unit, Queensland Parks and Wildlife Service & Partnerships, DES. Brisbane. See also: Dwyer, J.M., Fensham, R., and Buckley, Y.M. Restoration thinning accelerates structural development and carbon sequestration in an endangered Australian ecosystem. (2010). In *Journal of Applied Ecology*, 47, pp.681-691.

[6] Jackson, J. (2004) PhD thesis UQ). *Impacts and Management of* Cenchrus ciliaris *(Buffel Grass) as an Invasive Species in Northern Queensland*. See also: Marshall, N. & van Klinken R.D. (2009) *Quantifying costs and benefits of buffel grass*, Land & Water Australia, Canberra. See also: Melzer, R.I. (2015) When is stock grazing an appropriate 'tool' for reducing 'Cenchrus ciliaris' (Buffel grass) on conservation reserves? *Proceedings of the Royal Society of Queensland*, 120, 53-68.

Management measures	Risks addressed by the management measure
Control of weeds	• Reduces the degradation of MNES habitat • Reduces the abundance of non-native grass species • Increases the richness and abundance of native perennial grasses

Regular offset area reports will be prepared by the proponent as listed in *Table 41* and *Table 42* (Refer to *Section 15*) to report against each of the management actions.

These management actions enable the offset site to improve to achieve the scores in *Table 22*, thus attaining and maintaining the completion criteria required of the offset. The reports will provide transparency regarding how the site management actions are being implemented, and where relevant, identify any force majeure events impacting the offset site, and any non-compliance with the management plan.

As the approval holder, Bowen Basin Coal will be accountable for implementing the OAMP. Completing the actions will be ensured through the annual reporting requirements (*Section 11*). The approval holder will coordinate reporting, reviewing, inspections, auditing and any adaptive management changes to the plan. A person within Bowen Basin Coal (e.g. Environment Manager) will be assigned the responsibility of managing offset requirements for the company.

The approval holder will enter into an arrangement with the lessee to undertake the offset management actions and day to day management of the site, including fencing, managing fire breaks, weed management, feral animal management and grazing management. The lessee will also undertake the landholder reporting as per *Table 42*.

9.4 Timeframe of the offset

The proposed time until ecological benefit has been set at 20 years for each of the matters. This has been selected to enable the maximum time for the improvement in the number of large trees with hollows and also for a realistic methodology for reducing the buffel grass cover in the area to be established and implemented across the offset area. Despite the status of buffel grass as a highly valued pasture species, it is regarded as a serious weed as it is associated with the loss of native species and altered fire regimes (Jackson, 2004).

Thinning of eucalypts can result in an increase in tree diameter due to a reduction in the tree density. 'Restoration thinning' involves the selective removal of stems in woody ecosystems to restore historical or ecologically desirable ecosystem structure and processes. The process can result in a net gain in living above-ground biomass, increased diversity of woody species and grass cover, which in turn provides important habitat for native fauna (Dwyer et al, 2010). Accordingly, the restoration thinning process can lead to better environmental outcomes more quickly.

9.4.1 Risk of loss

The risk of loss being proposed is based on the risk of loss for the Isaac Regional Council region (as outlined in the National Environmental Science Programme's *Guidance for Deriving 'Risk of Loss' Estimates When Evaluating Biodiversity Offset Proposals under the EPBC Act*, April 2017.[7]

[7] https://www.nespthreatenedspecies.edu.au/media/zpyajjq1/5-1-guidance-for-deriving-risk-of-loss-report_2017_low-res.pdf

9.5 Legally binding mechanism for the offset site

The offset will be secured be being declared as an area of high conservation value under section 19F of the VM Act. The declared area will remain in place as the legally securing mechanism for the offset area. The declared area and approved OAMP will ensure the offset completion criteria are attained, and then maintained for the period of the EPBC Act approval. Statutory protection of the offset area is maintained under the VM Act, *Nature Conservation Act 1992* (Qld) (**NC Act**) and EPBC Act (or subsequent legislation). *Section 10* provides further details about the legally binding mechanism.

9.6 Offset completion criteria

Offset completion criteria have been determined for each species based on an understanding of the connectivity and other ecological values for the Brigalow TEC and specific habitat for ornamental snake, koala, and greater glider. These criteria were initially derived from detailed ecology survey information of both the impact and offset sites utilising an approach specified within the *Guide to determining terrestrial habitat quality* (DES, 2020). The targeted habitat quality meets guidelines published by ANZMEC (2000), stating completion criteria should be:

1. Specific enough to reflect unique set of environmental, social and economic circumstances.
2. Flexible enough to adapt to changing circumstances without compromising objectives.
3. Include environmental indicators suitable for demonstrating that rehabilitation trends are heading in the right direction.
4. Undergo periodic review resulting in modification if required due to changed circumstances or improved knowledge.
5. Based on targeted research which results in more informed decisions.

Over the course of the management period a set number of interim completion criteria have been proposed for each species to track the trajectory of habitat quality improvement towards the desired final completion criteria (*Table 22*). The timing for these interim targets corresponds with the 5 yearly targeted species surveys and detailed ecological condition monitoring in years 2028, 2033, 2038 and 2043.

Interim targets were derived for each species by identifying the attributes expected to increase over the period of the approval. The values were determined by differentiating between specific attributes of which the majority were longer term targets (e.g. species richness, tree canopy cover, number of large trees) and those where an initial benefit could be realised early (e.g. recruitment of woody species, non-native plant cover).

The completion of management actions identified in *Table 21: Management measures* will enable the offset site to improve and achieve the scores required in *Appendix B*, thus meeting and maintaining the completion criteria required of the offset. The annual reports will provide transparency regarding how the site management actions are being implemented, and where relevant, identify any force majeure events impacting the offset site, and any non-compliance with the management plan.

Table 22: Interim targets and completion criteria

Protected matter	EPBC Status	Total impact area Stages 1-3 (ha)	Habitat quality score	Assessment Units	Number of assessment sites	Offset area (ha)	Regional ecosystems	Habitat start quality score	Habitat quality score Year 5	Habitat quality score Year 10	Habitat quality score Year 15	Habitat finish quality score
Brigalow TEC	*Endangered*	7.6	5.01	1, 6	4	23.0	11.3.1 11.4.8	5.45	5.5-6.0	6.0-6.5	6.5-7.0	7
Poplar Box TEC	*Endangered*	44.4	7.14	2	3	291.7	11.3.2	6.53	6.5-7.0	7.0-7.5	7.5-8.0	8
Ornamental snake	*Vulnerable*	42.0	4.10	1, 3, 6, 8	10	92.0	11.3.1, 11.3.25, 11.4.8, HVR (11.4.8)	4.64	5.5-6.0	6.0-6.5	6.5-7.0	7
Greater glider	*Vulnerable*	93.58	4.96	2, 3, 4, 5, 11	9	365.0	11.3.2, 11.3.25, 11.3.27b, 11.3.4, 11.3.9	5.69	5.5-6.0	6.0-6.5	6.5-7.0	7
Koala	*Vulnerable*	102.1	5.89	2, 3, 4, 5, 7, 11	11	480.00	11.3.2, 11.3.25, 11.3.27b, 11.3.4, 11.3.9, 11.5.3	5.78	5.8-6.0	6.0-6.5	6.5-7.0	7

10 Security mechanism

This offset will be secured be being declared as an area of high conservation value under section 19F of the VM Act. Once this has been registered on the title, the offset area will be mapped as a category A area on the PMAV. An area mapped as category A on a PMAV is described as an 'area subject to compliance notices, offsets and voluntary declarations'.

The approval holder will legally secure the environmental offset within 2 years from the date that the OAMP is approved in writing by the Minister (noting that this timeframe is determined by the length of time required by the Queensland Department of Resources (**DoR**) in processing the declaration). The approved OAMP must be attached to the legal mechanism used to legally secure the environmental offset. The approval holder will notify the Department within 5 business days of the mechanism to legally secure the environmental offset having been executed.

Once approved under the EPBC Act, the OAMP will be attached to the declared area, and management and monitoring of the offset area will be undertaken in accordance with commitments in the approved OAMP.

The declared area will remain in place as the legally securing mechanism for the offset area. The declared area and approved OAMP will ensure the offset completion criteria are attained, and then maintained for the period of the EPBC Act approval. Statutory protection of the offset area is maintained under the VM Act, NC Act and EPBC Act (or subsequent legislation). The agencies charged with the enforcement of the mechanism are the relevant Queensland and Australian Government departments administering these Acts. This level of governance ensures that the proposed offset meets the principles of the EOP.

Funding for the management activities undertaken by the lessee is disbursed on an annual basis. The specific terms and amounts will be commercial-in-confidence; however, are underpinned by contractual arrangements between the Project proponent and the lessee.

11 Compliance with the Offsets Policy principles

The EPBC Act Offsets Policy outlines a series of principles that must be met for all offsets. This section demonstrates that the proposed offset outcomes (including the security mechanism chosen) will satisfy those principles.

Table 23 outlines each of the policy principles and how it has been considered in this OS, with a reference to the relevant OS section.

Table 23: EPBC Act Environmental Offset Policy principles

Policy principle	Project offsets
Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matters.	The offset will deliver a positive conservation outcome by providing like-for-like habitat for the following species: ornamental snake, greater glider, and koala. The offset will also deliver a conservation outcome for the brigalow TEC through the regeneration and recovery of related REs. The habitat will be managed to improve the habitat values for those species, and the declaration of the area under the VM Act will ensure legal protection of the area for the duration of the impact.

Policy principle	Project offsets
Suitable offsets must be built around direct offsets but may include other compensatory measures.	More than 100% of the Project's MNES offset obligations for brigalow TEC, poplar box TEC, ornamental snake, greater glider, and koala will be acquitted by the proposed direct land-based offsets.
Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter.	The status of the impacted threatened species has been taken into account by the offset assessment guide that has been used to calculate the offset area requirements. The ornamental snake, greater glider and koala are all listed under the EPBC Act as vulnerable at the time of the controlled action decision for the Project, and the Project assessment and approvals are subject to listing status at the time of the controlled action decision.
Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter.	The extent of the offset has been calculated using ecological reports that include both flora and fauna surveys, for both the impact and offset sites to inform inputs into the offset assessment guide (**OAG**). The inputs to the OAGs for each of the protected matters impacted are detailed in *Section 6*.
Suitable offsets must effectively account for and manage the risks of the offset not succeeding.	The risks associated with the offset have been assessed (*Table 40*) and mitigation and appropriate management actions proposed in the offset area management measures shown in *Table 21.* In addition, uncertainty, and therefore risk, associated with averted loss and net gain in habitat quality were addressed by applying the offset assessment guide.
Suitable offsets must be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs.	The VM Act is the statewide law regulating the clearing of native vegetation in Queensland. It is administered by the Department of Resources and applies to all land tenures – private (freehold) land, as well as leasehold and unallocated State land. The VM Act interacts with the *Planning Act 2016* (Qld) and the Planning Regulation 2017 to regulate the clearing of native vegetation on both freehold and leasehold land and certain other tenures in Queensland. Vegetation clearing as a native forest practice, or a forest practice, and grazing on the offset site, is not currently prohibited by legal mechanisms at either the local, state or Australian government legislative level. The area is zoned rural and has been used for timber harvesting and cattle grazing previously. Areas of the offset property have been subject to vegetation clearing[8] since the late 1970s as part of the Brigalow Development Scheme. The current regulated vegetation will be secured via a declared area that has its head of power under the VMA. See *Section 12* for further detail. The offset management actions will be additional to what is required of the landholder under the *Biosecurity Act 2014* (Qld). See *Section 9*.
Suitable offsets must be efficient, timely, transparent, scientifically robust and reasonable	The proposed offsets will be efficient and timely as the offsets for each Stage will be established and implementation of the OAMP commenced prior to impacting the protected matters. The offsets' scale and suitability are transparent, and the offsets are based on the terrestrial ecology reports prepared by suitably qualified ecologists for the impact and offset sites (*Attachment 1*); They have been prepared using the EPBC Act OAG inputs and calculators.

[8] *Vegetation Management Act 1999*, Schedule dictionary

Policy principle	Project offsets
Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.	Funding for the management activities implemented by the landholder/lessee is disbursed on an annual basis. The specific terms and amounts will be commercial-in-confidence; however, are underpinned by contractual arrangements between the project proponent and the lessee. The offset site was surveyed during March/April 2022, providing the baseline habitat quality assessment and these scores compared against the relevant bio-condition benchmarks for attributes relevant to the protected matters. Habitat quality assessments were conducted in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.8, 2020*, which involved collecting spatial data; and conducting in situ vegetation surveys, assessing site condition, spatial context as well as targeted species habitat criteria. Refer to Section 2.2 of the offset site ecological assessment at *Attachment 1.3*. These habitat assessment measurements will be conducted in accordance with this plan during its implementation phase. Monitoring and reporting are detailed in the offset area management measures outlined in *Table 21*, and the monitoring schedule and reporting schedule are shown in *Table 41* and *Table 42*. The offset will be protected from clearing and secured via a declared area that has its head of power under the VMA. Refer to *Section 10* for further detail.

12 Offset assessment tables

This section provides summarised habitat quality tables for each of the MNES offsets. There are three tables for each MNES:

- A table detailing the current actual quality of the site
- A table estimating the likely future quality of the site, should the offset not proceed
- A table projecting the future quality of the offset site once the offset management measures are implemented.

Tables showing the fully detailed habitat quality scores for each assessment site within each AU for each MNES offset are provided in *Appendix B*.

Table 24: Offset assessment table for brigalow TEC – current quality

Assessment units RE Habitat quality scores (weighted)	AU1 11.3.1	AU8 HVR (11.4.8)	Total:
Site condition score (-/7)	3.68	3.63	
Site context score (-/3)	1.20	1.93	
Habitat quality score (-/10):	**4.88**	**5.57**	
AU area within offset area (ha)	3.90	19.10	
Total offset area for this MNES (ha)	23.00	23.00	
Area weighting	0.17	0.83	
Weighted habitat quality score:	**0.83**	**4.62**	**5.45**

Table 25: Offset assessment table for brigalow TEC – future quality without offset

Assessment units RE Habitat quality scores (weighted)	AU1 11.3.1	AU8 HVR (11.4.8)	Total:
Site condition score (-/7)	3.68	3.63	
Site context score (-/3)	1.20	1.93	
Habitat quality score (-/10):	**4.88**	**5.57**	
AU area within offset area (ha)	3.90	19.10	
Total offset area for this MNES (ha)	23.00	23.00	
Area weighting	0.17	0.83	
Weighted habitat quality score:	**0.83**	**4.62**	**5.45**

Table 26: Offset assessment table for brigalow TEC – future quality with offset

Assessment units RE Habitat quality scores (weighted)	AU1 11.3.1	AU8 HVR (11.4.8)	Total:
Site condition score (-/7)	4.86	5.17	
Site context score (-/3)	1.20	1.93	
Habitat quality score (-/10):	**6.06**	**7.11**	
AU area within offset area (ha)	3.90	19.10	
Total offset area for this MNES (ha)	23.00	23.00	
Area weighting	0.17	0.83	
Weighted habitat quality score:	**1.03**	**5.90**	**6.93**

Table 27: Offset assessment table for poplar box TEC – current quality

Assessment units RE Habitat quality scores (weighted)	AU2 11.3.2	Total:
Site condition score (-/7)	3.61	
Site context score (-/3)	2.93	
Habitat quality score (-/10):	**6.53**	
AU area within offset area (ha)	291.70	
Total offset area for this MNES (ha)	291.70	
Area weighting	1.00	
Weighted habitat quality score:	**6.53**	**6.53**

Table 28: Offset assessment table for poplar box TEC – future quality without offset

Assessment units RE	AU2 11.3.2	
Habitat quality scores (weighted)		**Total:**
Site condition score (-/7)	3.04	
Site context score (-/3)	2.93	
Habitat quality score (-/10):	**5.97**	
AU area within offset area (ha)	291.70	
Total offset area for this MNES (ha)	291.70	
Area weighting	1.00	
Weighted habitat quality score:	**5.97**	**5.97**

Table 29: Offset assessment table for poplar box TEC – future quality with offset

Assessment units RE	AU2 11.3.2	
Habitat quality scores (weighted)		**Total:**
Site condition score (-/7)	5.12	
Site context score (-/3)	3.00	
Habitat quality score (-/10):	**8.12**	
AU area within offset area (ha)	291.70	
Total offset area for this MNES (ha)	291.70	
Area weighting	1.00	
Weighted habitat quality score:	**8.12**	**8.12**

Table 30: Offset assessment table for ornamental snake habitat – current quality

Assessment units RE Habitat quality scores (weighted)	AU1 11.3.1	AU3 11.3.25	AU6 11.4.8	AU8 HVR (11.4.8)	Total:
Site condition score (-/3)	1.52	1.25	2.24	2.02	
Site context score (-/3)	2.09	0.86	2.86	1.39	
Species stocking rate score (-/4)	2.00	1.14	2.00	0.57	
Habitat quality score (-/10):	**5.61**	**3.25**	**7.10**	**3.98**	
AU area within offset area (ha)	3.90	12.28	20.30	55.52	
Total offset area for this MNES (ha)	92.00	92.00	92.00	92.00	
Area weighting	0.04	0.13	0.22	0.60	
Weighted habitat quality score:	**0.24**	**0.43**	**1.57**	**2.40**	**4.64**

Table 31: Offset assessment table for ornamental snake habitat – future quality without offset

Assessment units RE Habitat quality scores (weighted)	AU1 11.3.1	AU3 11.3.25	AU6 11.4.8	AU8 HVR (11.4.8)	Total:
Site condition score (-/3)	1.52	1.25	2.24	0.46	
Site context score (-/3)	2.09	0.86	2.86	2.86	
Species stocking rate score (-/4)	2.00	1.14	2.00	0.00	
Habitat quality score (-/10):	**5.61**	**3.25**	**7.10**	**3.32**	
AU area within offset area (ha)	3.90	12.28	20.30	55.52	
Total offset area for this MNES (ha)	92.00	92.00	92.00	92.00	
Area weighting	0.04	0.13	0.22	0.60	
Weighted habitat quality score:	**0.24**	**0.43**	**1.57**	**2.00**	**4.24**

Table 32: Offset assessment table for ornamental snake habitat – future quality with offset

Assessment units RE Habitat quality scores (weighted)	AU1 11.3.1	AU3 11.3.25	AU6 11.4.8	AU8 HVR (11.4.8)	Total:
Site condition score (-/3)	2.49	2.16	2.61	2.56	
Site context score (-/3)	2.39	3.00	3.00	2.86	
Species stocking rate score (-/4)	2.00	2.00	2.00	0.57	
Habitat quality score (-/10):	**6.89**	**7.16**	**7.61**	**5.99**	
AU area within offset area (ha)	3.90	12.28	20.30	55.52	
Total offset area for this MNES (ha)	92.00	92.00	92.00	92.00	
Area weighting	0.04	0.13	0.22	0.60	
Weighted habitat quality score:	**0.29**	**0.96**	**1.68**	**3.61**	**6.54**

Table 33: Offset assessment table for greater glider habitat – current quality

Assessment units RE Habitat quality scores (weighted)	AU2 11.3.2	AU3 11.3.25	AU4 11.3.27b	AU5 11.3.4	AU11 11.3.9	Total:
Site condition score (-/3)	1.98	2.09	1.58	1.42	1.51	
Site context score (-/3)	1.77	1.93	1.89	1.66	1.66	
Species stocking rate score (-/4)	2.00	2.00	2.00	2.00	0.57	
Habitat quality score (-/10):	**5.76**	**6.02**	**5.47**	**5.08**	**3.74**	
AU area within offset area (ha)	288.33	29.10	5.76	38.83	2.99	
Total offset area for this MNES (ha)	365.00	365.00	365.00	365.00	365.00	
Area weighting	0.79	0.08	0.02	0.11	0.01	
Weighted habitat quality score:	**4.55**	**0.48**	**0.09**	**0.54**	**0.03**	**5.69**

Table 34: Offset assessment table for greater glider habitat – future quality without offset

Assessment units RE	AU2 11.3.2	AU3 11.3.25	AU4 11.3.27b	AU5 11.3.4	AU11 11.3.27f	
Habitat quality scores (weighted)						**Total:**
Site condition score (-/3)	1.98	2.09	1.58	1.42	1.51	
Site context score (-/3)	1.77	1.93	1.89	1.66	1.66	
Species stocking rate score (-/4)	2.00	2.00	2.00	2.00	0.57	
Habitat quality score (-/10):	**5.76**	**6.02**	**5.47**	**5.08**	**3.74**	
AU area within offset area (ha)	288.33	29.10	5.76	38.83	2.99	
Total offset area for this MNES (ha)	365.00	365.00	365.00	365.00	365.00	
Area weighting	0.79	0.08	0.02	0.11	0.01	
Weighted habitat quality score:	**4.55**	**0.08**	**0.09**	**0.54**	**0.03**	**5.69**

Table 35: Offset assessment table for greater glider habitat – future quality with offset

Assessment units RE	AU2 11.3.2	AU3 11.3.25	AU4 11.3.27b	AU5 11.3.4	AU11 11.3.27f	
Habitat quality scores (weighted)						**Total:**
Site condition score (-/3)	2.30	2.62	2.47	1.67	1.96	
Site context score (-/3)	2.54	2.57	2.68	2.57	2.57	
Species stocking rate score (-/4)	2.29	2.29	2.29	2.29	0.86	
Habitat quality score (-/10):	**7.13**	**7.60**	**7.43**	**6.52**	**5.38**	
AU area within offset area (ha)	288.33	29.09	5.76	38.83	2.99	
Total offset area for this MNES (ha)	365.00	365.00	365.00	365.00	365.00	
Area weighting	0.79	0.08	0.02	0.11	0.01	
Weighted habitat quality score:	**5.63**	**0.61**	**0.12**	**0.69**	**0.04**	**7.09**

Table 36: Offset assessment table for koala habitat – current quality

Assessment units RE Habitat quality scores (weighted)	AU2 11.3.2	AU3 11.3.25	AU4 11.3.27b	AU5 11.3.4	AU7 11.5.3	AU11 11.3.9	Total:
Site condition score (-/3)	1.73	1.59	1.06	1.21	1.28	1.47	
Site context score (-/3)	2.44	2.46	2.42	2.46	2.46	2.46	
Species stocking rate score (-/4)	1.71	2.00	2.00	1.71	0.00	1.71	
Habitat quality score (-/10):	**5.88**	**6.06**	**5.48**	**5.39**	**3.75**	**5.64**	
AU area within offset area (ha)	289.90	29.09	5.76	38.83	2.99	113.43	
Total offset area for this MNES (ha)	480.00	480.00	480.00	480.00	480.00	480.00	
Area weighting	0.60	0.06	0.01	0.08	0.01	0.24	
Weighted habitat quality score:	**3.55**	**0.37**	**0.07**	**0.44**	**0.02**	**1.33**	**5.78**

Table 37: Offset assessment table for koala habitat – future quality without offset

Assessment units RE Habitat quality scores (weighted)	AU2 11.3.2	AU3 11.3.25	AU4 11.3.27b	AU5 11.3.4	AU7 11.5.3	AU11 11.3.9	Total:
Site condition score (-/3)	1.73	1.59	1.06	1.21	1.28	1.47	
Site context score (-/3)	2.44	2.46	2.42	2.46	2.46	2.46	
Species stocking rate score (-/4)	1.71	2.00	2.00	1.71	0.00	1.71	
Habitat quality score (-/10):	**5.88**	**6.06**	**5.48**	**5.39**	**3.75**	**5.64**	
AU area within offset area (ha)	289.90	29.09	5.76	38.83	2.99	113.43	
Total offset area for this MNES (ha)	480.00	480.00	480.00	480.00	480.00	480.00	
Area weighting	0.60	0.06	0.01	0.08	0.01	0.24	
Weighted habitat quality score:	**3.55**	**0.37**	**0.07**	**0.44**	**0.02**	**1.33**	**5.78**

Table 38: Offset assessment table for koala habitat – future quality with offset

Assessment units RE Habitat quality scores (weighted)	AU2 11.3.2	AU3 11.3.25	AU4 11.3.27b	AU5 11.3.4	AU7 11.5.3	AU11 11.3.9	Total:
Site condition score (-/3)	1.90	2.65	2.31	2.09	2.48	2.48	
Site context score (-/3)	3.00	3.00	3.00	3.00	3.00	3.00	
Species stocking rate score (-/4)	2.57	2.57	2.57	2.29	0.00	2.29	
Habitat quality score (-/10):	**7.47**	**8.23**	**7.88**	**7.37**	**5.48**	**7.77**	
AU area within offset area (ha)	289.90	29.09	5.76	38.83	2.99	113.43	
Total offset area for this MNES (ha)	480.00	480.00	480.00	480.00	480.00	480.00	
Area weighting	0.60	0.06	0.01	0.08	0.01	0.27	
Weighted habitat quality score:	**4.51**	**0.50**	**0.09**	**0.60**	**0.03**	**1.84**	**7.57**

13 Offsets assessment guide

The results of the habitat quality assessments of the 10 different vegetation community assessment units that occur within the offset areas are summarised in *Table 24* to *Table 38.* The field data sheets are provided within the ecology reports (see *Attachment 1B*).

Detailed maps of the offset areas for each MNES in this OS are shown at *Figure 13* to *Figure 17*. The offset area has been determined utilising outputs from the DCCEEW OAG. The full OAG outputs for each MNES are shown in *Appendix C*.

14 Risk analysis

This OS has considered the risks that may inhibit achieving the completion criteria for the offset site, including risks that may be wholly outside the proponent's control. The risks have been assessed against the risk matrix supplied by DCCEEW (*Table 39*) in *Table 40* below. The risk analysis:

- Identifies events and threats that will, may, or are likely to impact the attainment of the completion criteria
- Assesses the likelihood and consequences of those events and threats eventuating, both before and after risk controls are applied, and assesses residual risk levels
- Identifies levels of uncertainty in mitigating the risks, with appropriate trigger criteria for corrective actions should risks and threats eventuate. The proposed corrective actions will be detailed in full in the Offset Management Plan.

Table 39: Risk matrix

RISK MATRIX	
Qualitative measure of likelihood (how likely is it that this event/circumstances will occur after management activities are implemented) (L)	
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
Qualitative measure of consequences (what will be the consequence/result if the issue does occur) (C)	
Minor	Minor incident of environmental damage that can be reversed (*e.g. short-term delays to achieving plan objectives, implementing low-cost, well-characterised corrective actions*)
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts (*e.g. short-term delays to achieving plan objectives, implementing well-characterised, high-cost/effort corrective actions*)
High	Substantial instances of environmental damage that could be reversed with intensive efforts (*e.g. medium-long term delays to achieving objectives, implementing uncertain, high-cost/effort corrective actions*)
Major	Major loss of environmental amenity and real danger of continuing (*e.g. plan objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies*)
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage (*e.g. plan objectives are unable to be achieved, with no evidenced mitigation strategies*)

Final risk rating (a function of multiplying (L) and (C) = (R)

		Consequence				
		Minor	**Moderate**	**High**	**Major**	**Critical**
Likelihood	**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 40: Risk assessment for the offset site

Note: The risk ranking codes relate to the risk matrix as follows: L = Likelihood C = Consequence R = Risk

Risk	Threats	Initial risk ranking L	C	R	Management measures	Management measures/actions	Residual risk ranking L	C	R
Force majeure events									
Mining of the offset site	No current permits cover the proposed offsets site. Open cut mining may produce full clearing of the offset site.	Rare	Critical	High	Offset area management	No current permits cover the offset sites. The legal security over the site makes it known that the area is an offset. No available legal mechanism would render mining impossible on the offset site, however the declared area under the VMA would significantly increase offset obligations upon any person proposing to impact the offset site.	Rare	Critical	High
Drought	The threat posed by drought is a decrease in dry matter yield and groundcover, an increase in the likelihood of unplanned fire due to the dry conditions that could be started by lightning strike during storms and an increase in weed cover when rainfall was received. There would also be lower levels of growth expected.	Likely	Moderate	Medium	Offset area management Grazing management	Cattle will be excluded from the offset area during times of drought. Limited mitigation measures can be implemented. Should the offset be deemed by the approval holder or the Department to be delayed due to drought, both parties will work together to determine an appropriate response.	Likely	Moderate	Medium
Cyclones/ severe tropical lows/ flooding	The most significant impact from tropical cyclones or tropical lows is typically flooding. Systems generally form between November and April.	Likely	Moderate	Medium	Offset area management	Limited mitigation measures can be implemented. The offset areas are in elevated parts of the landscape and the likelihood of extended flooding of the areas is extremely low. Wind damage to bigger trees would be expected to be the largest impact. However, cyclones and/or severe tropical lows are relatively infrequent (though likely to occur at some point during the life of the approval). However, flooding is not expected to be of sufficient duration, and winds are not expected to be sufficiently severe, to cause substantial long-term harm to the site. Additionally, the increased availability of soil moisture following extreme weather events is expected to increase growth rates, likely assisting natural repair of any potential damage. Increased soil moisture may assist weed growth, so a meander survey across the entire site will occur as soon after the end of a cyclone and any associated flooding as is safe and reasonably practicable to detect any areas of increased weed density. Flooding may also contribute to erosion (see below).	Likely	Minor	Low
Degradation of habitat or vegetation loss through land clearing									
Degradation of habitat	The degradation of habitat due to the lack of environmental management of the offsets area including appropriate grazing regimes, invasive plant control, fire management, and/or infrastructure maintenance.	Possible	High	Medium	Offset area management Grazing management	Implementation of the management actions and adaptive management framework as outlined in the OAMP	Unlikely	Minor	Low
Erosion	Raindrops hit bare soil with enough force to break the soil aggregates. These fragments wash into soil pores and prevent water from infiltrating the soil. Water then accumulates on the surface and increases runoff which takes soil with it.	Highly likely	Minor	Medium	Offset area management Grazing management	The expected severity of erosion at this site may occur due to topography of the site. However, that risk can be further reduced. At least dry matter yield of 1200kg/ha will be maintained at all times and stock will be removed from the offset site before that minimum level would be breached.	Possible	Minor	Low
Timber harvesting/ collection	Unauthorised access to the offset area may result in timber harvesting/collection Such actions would delay the establishment of the TEC.	Unlikely	Moderate	Low	Offset area management Site access control	Complete the installation of signage at all vehicle accesses identifying the areas as an environmental offset, within six months of the approval of the OAMP. Complete the installation of any new planned fences, within twelve months of the approval of the OAMP. All field monitoring (rapid and detailed) will report on any evidence of timber harvesting.	Rare	Moderate	Low

Risk	Threats	Initial risk ranking L	Initial risk ranking C	Initial risk ranking R	Management measures	Management measures/actions	Residual risk ranking L	Residual risk ranking C	Residual risk ranking R
Unplanned clearing	The offset site occurs within Stoney Creek, a property that is used for cattle production. It is possible for unplanned / illegal clearing for agriculture activities but considered improbable as the offset site will be mapped as Category A on the PMAV. Clearing can also occur by vehicles traversing the area off designated roads/tracks and/or illegal camping. This is also considered improbable, as the site is remote and access to the site will be restricted. The most plausible (though still unlikely) cause of unplanned/illegal clearing would be if aerial spraying on adjacent properties strayed across the offset boundary.	Unlikely	Major	High	Offset area management Site access control	Complete the installation of signage at all vehicle accesses identifying the areas as an environmental offset, within six months of the approval of the OAMP. Complete the installation of any new fences, within twelve months of the approval of the OAMP. Within six months of the approval of the OAMP, register a declared area over the Offset Site, ensuring it is shown as Category A vegetation on the PMAV. All monitoring (rapid and detailed) will report on any evidence of clearing.	Rare	Major	Medium
Fire: the impact from uncontrolled fire would be a reduction in groundcover, thinning of the canopy and slowing of the offset site achieving the completion criteria									
Unplanned or non-controlled fire in offset area.	The impact from uncontrolled fire would be a reduction in dry matter yields and overall groundcover, thinning of the canopy, destruction of regrowth and emerging saplings and an overall slowing of the offset site achieving the completion criteria.	Likely	Moderate	Medium	Fire management	The offset site is comprised of remnant eucalypt species circa 12-22m in height. These communities are adapted to fire and the risk of a 100% loss is low due to lower dry matter yields (fuel load) within the communities that are further managed with grazing.	Possible	Minor	Low
Increased fire risk due to high fuel loads	During periods when a low-level grazing regime has occurred and an average or above average wet season, there is an opportunity for fuel loads in the form of dry matter to accumulate to unacceptable levels. When this occurs and the high levels of fuel are present prior to summer, then the risk of wild and/or high-intensity fires is exacerbated.	Possible	High	Medium	Fire management	Graze to reduce dry matter yield to <1,200kg/ha. Reduction of non-native grasses will reduce the fuel load and therefore the risk of uncontrolled hot fires. On the offset area, a cold fire to be used during the months of June, July, August and September when wind speeds are less than 5km/h on the offset site.	Unlikely	Minor	Low
Invasive plants: introduction, establishment and spread of non-native weeds including restricted invasive plants listed under the* Biosecurity Act 2014 *(Qld)									
New infestations of invasive weed species in the offset area.	Infestation of previously unidentified invasive weeds within the offset area. If a weed infestation is unchecked, it may cause a significant deterioration in the offset site.	Possible	High	Medium	Invasive plants management listed under the *Biosecurity Act 2014* (Qld)	The offset sites are remote and access to the offset area will be limited, to reduce/prevent pathogen/propagule transmission vectors. All vehicles accessing the offset area are required to have undergone a weed inspection and vehicle hygiene check, confirming that they are weed free, before accessing the site. If a new weed infestation is identified, weed management measures will occur as per *Table 21.*	Unlikely	Minor	Low
Expansion of existing infestations of declared weed species in the offset area	The extent of existing infestations of restricted invasive plants species expand or the species become more abundant within the area.	Highly likely	High	High	Invasive plants management listed under the *Biosecurity Act 2014* (Qld)	Access to the offset area will be restricted. Chemical and/or mechanical control of all restricted invasive plants in accordance with the control measures outlined in the Biosecurity Queensland Fact Sheets or other sources of information.	Unlikely	Minor	Low

Pest/feral animals in the offset area									
Increased population of feral animals in the offset area.	Wild cat, pig and dog populations are extensive and highly transient, and therefore the scale of impact is potentially large. Major damage to the environment/habitat occurs when large numbers of animals congregate in the area.	Highly likely	High	High	Pest animal management Feral pig management	Current control of pigs and wild dogs is undertaken via a baiting program on the property. This is augmented with shooting and trapping of wild pigs if numbers increase. Additionally, the lessee, during quarterly inspections of the offset area may remove any wild cats, pigs or wild dogs that are seen. If an increase in pig or dog activity is noted, an additional trapping, baiting and/or control program is to be instigated until the increased activity has ceased.	Possible	Minor	Low
Degradation of habitat by overgrazing									
Unauthorised or inappropriate grazing in offset area	High density grazing over an extended period destroys shrubs and native grass cover and slows the regeneration of habitat. The natural condition of the native ground cover is a low cover and hence any grazing undertaken is to reduce exotic grass cover whilst retaining a minimum of 700kg/ha of dry matter yield at the end of the dry season. Stocking rates are not fixed as this region is subject to significant changes in grass cover with seasonal conditions.	Possible	High	Medium	Grazing management	Fences are in working order and allow for exclusion of cattle when needed. Signage will be installed on all major access gates to ensure the environmental offset area is well signposted. Stocking rates are not fixed as this region is subject to significant changes in grass cover with seasonal conditions. However, grazing used as required when dry matter yields exceed 1200kg/ha and the fire risk is high. Cattle are excluded from all areas during the wet season. Cattle are excluded from all areas during drought and when dry matter yields are below 1200kg/ha	Unlikely	Minor	Low
Degradation of habitat or vegetation loss through thickening of native vegetation									
Thickening of vegetation in the offset area	Clearing or the harvesting of the larger trees for sawlogs and other timber products has resulted in a large number of eucalypt seedlings establishing resulting in a thickened or high stem density. The soil has a finite resource of nutrients and water, and this high density of stems results in a situation whereby the stems cease growing and stay at an immature condition/size unless a force majeure event or intervention occurs to reduce the stem density and therefore allowing larger trees to establish and therefore hollows to be produced.	Possible	High	Medium	Offset area management	Ecological burns to be undertaken in the offset area only in REs 11.3.2 and 11.5.3 to reduce the stem density of the eucalypt vegetation when there is a density of >750 immature trees/ha[9]. This is done only to reduce competition for soil resources and therefore promote larger trees becoming established.	Unlikely	Minor	Low
Offset fails to achieve the interim performance targets and/or completion criteria within the anticipated 5-, 10-, 15- and 20-year timeframes, respectively									
Offset fails to achieve the interim performance targets and/or completion criteria within the anticipated 5, 10-, 15- and 20-year timeframes, respectively	Failure to achieve and maintain offset completion criteria	Possible	High	Medium	Offset area management	Implement the management actions of the OAMP. Monitor and report on attainment of interim environmental performance targets and completion criteria.	Unlikely	High	Medium

[9] Glossary, Accepted development vegetation clearing code, Managing regulated regrowth vegetation, Effective date 7th February 2020; compiled by the Department of Natural Resources, Mines and Energy

15 Monitoring schedule

The monitoring methods (*Table 41*) will enable comparative changes in vegetation condition against baseline data collected on the offset site, as well as attainment and maintenance of the offset completion criteria (see *Section 9*). Furthermore, the monitoring will measure changes resulting from the management actions and variability due to climatic conditions. This will inform the nature and frequency of management actions required and if trigger levels are breached, the use of corrective actions to bring the offset back into compliance.

Note that the methodologies listed, and the regional ecosystem benchmarks used in the establishment of the baseline data, will be used consistently throughout the reporting period to enable the comparison of data.

The approval holder, its successors or assigns, will provide an Annual Compliance Report each year following the date of the commencement of the action for the period of the approval. Offset Area Reports describing the progress of the offset area over the relevant 12-month period will be part of those reports until the completion criteria are achieved or the end of the EPBC approval, whichever comes first. The monitoring methodology and schedule is outlined in *Table 41*. The reporting schedule is provided in *Table 42*.

The Offset Area Reports will contain records substantiating all activities relevant to the implementation and management of the offsets.

Full site habitat quality assessments will be undertaken each five years by suitably qualified ecologists. Commonwealth threatened species survey guidelines used to inform the requirements of these terrestrial flora and fauna surveys will include:

- Survey guidelines for Australia's threatened reptiles (SEWPaC, 2011)
- Survey guidelines for Australia's threatened mammals (SEWPaC 2011)
- EPBC Act referral guidelines for the vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (DotE 2014)
- Draft Referral guidelines for the nationally listed Brigalow Belt reptiles (SEWPaC 2011)
- SPRAT databases for relevant EPBC Act listed species and communities.

The landholder or a suitably qualified person appointed by the landholder will undertake quarterly inspections of the offset area to observe and record dry matter yields, pest plants, accessibility (i.e. condition of fencing), evidence of fire and evidence of pest animal incursion. The inspection records will serve as the primary data source for the annual Offset Area Report.

Grass and weed cover measurement is to be undertaken as per the Level 1 methodology described in the *Land Manager's Monitoring Guide* (DERM, 2010).

Dry matter yields are to be assessed as per the Brigalow Belt pasture photo standards.[10]

[10] https://futurebeef.com.au/knowledge-centre/brigalow-belt-pasture-photo-standards

Table 41: Monitoring schedule and methodology to be used

Monitoring	Attributes monitored	Timing	Method	Location/s
Surveys undertaken by ecologists every 5 years				
Targeted habitat quality assessments of habitat	Nature and quality of habitat attributes for koala, greater glider and ornamental snake. Presence of koala, greater glider and ornamental snake in the offset area, including estimated numbers and location of sightings.	Each 5 years	*EPBC Act referral guidelines for the vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)* (DoE 2014). *Survey guidelines for Australia's threatened mammals* (SEWPaC 2011). *Draft Referral guidelines for the nationally listed Brigalow Belt reptiles* (SEWPaC 2011).	Across the offset area
Ecological condition and relevant habitat features using BioCondition assessments	Recruitment of woody perennial species in EDL	Each 5 years	Field observations, vegetation assessment as per the *BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland Assessment Manual* (Eyre et al., 2015) Data for each of the ecological condition attributes monitored will be collected at each site (final site locations are to be established) and reported on and presented in a sequential manner (including previous data collected) to quantify change from the baseline condition. This will record the change in each attribute measured and hence the condition of the habitat, thus enabling a statistical comparison to previous years' data and tracking towards attainment of the offset interim and final completion criteria. Scoring is to be consistent with the *Guide to Determining Terrestrial Habitat Quality Version 1.3* (Department of Environment and Science, 2020).	At sites to be established once final offset areas selected
	Native plant species richness – trees			
	Native plant species richness – shrubs			
	Native plant species richness - grasses			
	Native plant species richness – forbs			
	Tree canopy height			
	Tree canopy cover			
	Shrub canopy cover			
	Native perennial grass cover			
	Organic litter			
	Large trees			
	Coarse woody debris			
	Non-native plant cover			
	Quality and availability of food and foraging habitat			
	Quality and availability of shelter			

Monitoring	Attributes monitored	Timing	Method	Location/s
Note that the methodologies listed, and the RE benchmarks used in the establishment of the baseline data, will be used consistently throughout the reporting period to enable the comparison of data.				
Quarterly landholder/approval holder records and monitoring (report to approval holder – end of September, December, March and June each year)				
Forestry operations, native timber harvesting and general vegetation impacts	Any incidence of native plant destruction	Monitored quarterly and reported annually in Offset Area Report until the offset completion criteria are achieved.	Forestry operations, native timber harvesting and general vegetation impacts	Across the offset area
Unauthorised impacts to vegetation from activities such as illegal access/ camping	Vegetation, woody debris, grass cover, weed cover, feral animal damage and presence	Monitored quarterly and reported annually until the offset completion criteria are achieved.	Landholder or person appointed by the Landholder will undertake quarterly inspections of the offset area to observe and record grass cover levels, weeds, accessibility (i.e. condition of fencing), and evidence of fire, erosion, and feral animal incursion. The inspection records will be provided to the approval holder and serve as the primary data source for the Offset Area Report. Grass cover assessment is to be undertaken as per the DMY measurements in accordance with the Brigalow Belt pasture photo standards. This is in addition to biocondition assessments.	Across the offset area
Grazing	Cattle stocking rates Grass cover	Monitored monthly during grazing periods (dry season or as otherwise authorised) and reported annually until the offset completion criteria are achieved.		
Unplanned fire	Occurrence, control measures implemented, timing and result of the control measures.	Monitored quarterly and reported annually until the offset completion criteria are achieved.		
Weeds	Occurrence, control measures implemented, timing and the result of the control measures.	Monitored quarterly and reported annually until the offset completion criteria are achieved	Weed cover is to be monitored by the same methodology and at the same time as the grass cover measurements. This is in addition to biocondition assessments.	Across the offset area
Pest animals	Occurrence, control measures implemented, timing, number and type of animal/s and the result of the control measures.	Monitored quarterly and reported annually until the offset completion criteria are achieved	Quarterly inspections will involve traversing the offset area along streams, low lying areas and vehicle access tracks, to record the presence of wallow holes, tracks and any visual incidents. If detected, these locations will be GPS'd and photographed and rechecked at the next quarterly inspection. Any evidence of predation on koalas must be reported immediately to the approval holder and corrective actions implemented.	Across the offset area

Table 42: Reporting schedule

Report Details to DCCEEW	Reporting period	Submission due date
Annual Offset Area Report, which contributes to the Annual Compliance Report detailing photo points (including coordinates), implementation of management actions, any triggers for corrective actions and implementation of those corrective actions, if implemented, and offset condition outcomes, including habitat quality scores, condition of koala habitat and results of koala surveys, achieved for preceding reporting period. Note: the reports and results from detailed ecology survey (biocondition assessments) and monitoring events, such as koala surveys and koala habitat monitoring, conducted in accordance with *Table 41*, will be provided as an Appendix to the subsequent Annual Offset Area Report.	Annual Offset Area Report - from the date of approval of the OAMP to 30 May in the year after the date of approval of the OAMP for the first report	30 June in the year after the date of approval of the OAMP for the first report
	1 May – 30 May annually until the offset completion criteria are achieved and then every 5 years until the end of the approval.	30 June each year as required
Compliance report detailing compliance with approval conditions under the EPBC Act, including compliance with the offset conditions, as detailed in the OAMP.	Every 12 months following commencement of the action.	1 July every year for the duration of the approval

Declaration

I declare that to the best of my knowledge, all the information contained in, or accompanying this document is complete, current and correct.

I am duly authorised to sign this declaration on behalf of the proponent/approval holder. I am aware that:

Section 491 of the EPBC Act makes it an offence for a person to provide information or documents to specified persons who are known by the person to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 *(Cwth) where the person knows the information or document is false or misleading.*

I acknowledge that the above offences are punishable on conviction by imprisonment, a fine or both.

Signed:

Full name:

Organisation: Bowen Basin Coal Pty Ltd

EPBC Referral Number: EPBC 2019/8485

EPBC Offset Strategy

Date:

Glossary and sources

List of abbreviations

Abbreviation	Description
AHD	Australian Height Datum
AU	assessment unit
DAWE	Department of Agriculture, Water and the Environment (former)
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DES	Department of Environment and Science (Qld)
DoE	Department of the Environment (Commonwealth) (former)
DoEE	Department of the Environment and Energy (Commonwealth) (former)
DoR	Department of Resources (Qld)
EA	Environmental authority
EOP	Environmental Offsets Policy (October 2012) (EPBC Act)
EPBC Act	*Environment Protection & Biodiversity Conservation Act 1999* (Cth)
ha	hectares
HQS	Habitat quality scoring
HVR	high-value regrowth
km	kilometres
KoRV	Koala retrovirus
MDL	Mineral development licence
ML	Mining lease
MLA	Mining lease application
MNES	Matters of national environmental significance
Mtpa	Million tonnes per annum
NC Act	*Nature Conservation Act 1992* (Qld)
OAG	Offset Assessment Guideline (DCCEEW)
OAMP	Offset Area Management Plan
OS	Offset Strategy
PMAV	Property map of assessable vegetation
Project	Lake Vermont/Meadowbrook Project
RE	Regional ecosystem
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities (Commonwealth) (former)
TAP	Threat Abatement Plan
TEC	Threatened ecological community
TSSC	Threatened Species Scientific Committee
VM Act	*Vegetation Management Act 1999 (Qld)*

Definitions

Term	Definition
Approved conservation advice/s	A conservation advice approved by the Minister under section 266B(2) of the EPBC Act.
Brigalow (*Acacia harpophylla* dominant and co-dominant) ecological community/Brigalow TEC	The threatened ecological community as defined by the key diagnostic characteristics and condition thresholds in the *Approved Conservation Advice for the Brigalow (*Acacia harpophylla *dominant and co-dominant) ecological community* (2013), or subsequent published revision.
Category A vegetation	Under Queensland vegetation management legislation, Category A vegetation is an area which is: • a declared area • an offset area, an exchange area, an area that has been subject to unlawful clearing or an enforcement notice, an area subject to clearing as a result of a clearing offence • an area that the chief executive determines to be Category A. Category A areas are colour-coded red on the regulated vegetation management map. See *Vegetation Management Act 1999* (Qld), s20AL.
Category X vegetation	Under Queensland vegetation management legislation, all areas other than Category A, B, C and R areas are Category X areas. Some Category X areas are also identified on a property map of assessable vegetation (PMAV) as 'locked in'. Category X areas are also known as 'exempt areas' because activity in Category X areas is not regulated by the *Vegetation Management Act 1999*. Category X areas are colour-coded white on the regulated vegetation management map (see *Vegetation Management Act 1999* (Qld) s20A.).
Compliance report/s	Written reports: a) providing accurate and complete details of compliance, incidents, and non-compliance with the conditions and plans; b) consistent with the Department's Annual Compliance Report Guidelines (2014) (or subsequent published revision); c) include a shapefile of any impact of any protected matters, or their habitat, undertaken within the relevant 12 month period; and d) identifying the version/s of the plans prepared and in existence in relation to the conditions of this approval during the relevant 12 month period.
Control of grazing	Grazing specifically for the purposes of weed and fire management for one period per year (of no more than 2 weeks) prior to the annual fire season of the Bowen Basin and not occurring during the wet season of the Bowen Basin.
Defining bank	The bank which confines the seasonal flows but may be inundated by flooding from time to time. This can be either: • the bank or terrace that confines the water before the point of flooding; or • where there is no bank, the seasonal high water line which represents the point of flooding.
Department	The Australian Government Department responsible for the *Environment Protection and Biodiversity Conservation Act 1999*.

Term	Definition
Greater glider habitat	Greater glider (*Petauroides volans*) habitat means the vegetation that supports koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and contains hollow-bearing trees.
Habitat quality scores	A score out of ten, based on biocondition assessment plus an assessment of habitat quality. A method of evaluating habitat quality within a particular community based on key indicators including site condition, site context and species habitat index (if necessary). The method produces a score out of 10, where the maximum score of 10 represents a fully intact system. Scores of 4, 5 and 6 may indicate good quality regrowth or medium value habitat.
Habitat tree	Is a living or dead standing native tree that contains: • one or more visible hollows positioned at least two metres above the base of the tree2 or • an active bird's nest or the nest of a raptor or other bird that uses the same nest each year.
Immature tree	s any native woody ***vegetation*** (other than a ***mature tree*** or ***habitat tree***) that is two metres or more in height.
Independent suitably qualified expert	Person/s: • that does not have individually, or by employment or family affiliation, any conflicting or competing interests with the approval holder and/or suitably qualified ecologist; and • if the role is in relation to the greater glider, possessing a postgraduate degree (or equivalent or better) and a minimum 10 years of relevant experience in greater glider ecology research; or • if the role is in relation to the koala, possessing a postgraduate degree (or equivalent or better) and a minimum 10 years of relevant experience in koala ecology research.
Koala habitat	Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat means any forest or woodland containing koala food trees (i.e. *Eucalyptus* and *Corymbia* tree species) and any shrubland with emergent koala food trees.
Mature tree	Is a native tree that is: • a Eucalyptus, Corymbia, Lophostemon or Angophora species ('gum' or 'box' trees) with a single trunk or several trunks with a diameter of 30 centimetres or more • another tree species such as a wattle, with a single trunk with a diameter of 20 centimetres or more; or several trunks with a diameter of 25 centimetres or more. (If there are several trunks, add the diameters of the largest two trunks.)
Minister	The Minister administering the *Environment Protection and Biodiversity Conservation Act 1999*.
Offset calculator/OAG	The *Offset Assessment Guide* spreadsheet tool as provided by DCCEEW
Ornamental snake habitat	Ornamental snake (*Denisonia maculata*) known important habitat means gilgai mounds and depressions with cracking-clay soils, moist areas (particularly within, or close to, habitat that is known to be favoured by its prey [frogs]) with microhabitat features (i.e. logs, woody debris and leaf litter), and Brigalow TEC.
Property map of assessable vegetation	A map certified by the chief-executive as a PMAV for an area and showing the vegetation category areas for the area (e.g. Category C area, Category X area)

Term	Definition
	See *Vegetation Management Act 1999* (Qld), section 20AK.
Regional ecosystem	Regional ecosystems are vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil (Sattler and Williams 1999, *Vegetation Management Act 1999*).
Regrowth vegetation	Vegetation that is not remnant vegetation.
Regulated vegetation	Vegetation that: • is an endangered regional ecosystem, an of concern regional ecosystem, or a least concern regional ecosystem, and • forms the predominant canopy of the vegetation covering more than 50% of the undisturbed predominant capacity; averaging more than 70% of the vegetation's undisturbed height; and • composed of species characteristic of the vegetation's undisturbed predominant canopy.
Riparian zone	The area within a minimum of 100 metres of the defining bank of any watercourse (as defined under the Queensland *Water Act 2000*).
Site habitat quality	A score on a scale of 0 to 10 representing a site's utility for each listed threatened species, where zero ('0') represents a site of no value to the species, and '10' represents ideal habitat. Unless agreed otherwise by the Department, site quality must be comprised of 3 points for site condition, 3 points for site context, and 4 points for species stocking rate. These scores must be derived in accordance with the Queensland *Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy* (Version 1.2, April 2017), or subsequent published revision.
Site specific assessment/s	A baseline investigation which explains the scientific basis on which the description and location of impact/s and associated users, performance indicators, trigger values and limits have been derived, or not derived.
Suitably qualified ecologist	A person who has professional qualifications and at least 3 years of work experience designing and implementing surveys for the listed threatened species and their habitat, and can give an authoritative assessment and advice on the presence and habitat requirements of the listed threatened species using relevant protocols, standards, methods and/or literature.
Suitably qualified person	A person who has professional qualifications, training, skills and/or experience related to the nominated subject matter and can give authoritative independent assessment, advice and analysis on performance relative to the subject matter using the relevant protocols, standards, methods and/or literature.
Target low shrub species	Is a ***low shrub*** species which comprises more than 50 per cent of the ***ground cover*** in the area covered by a notification made under this code. See Accepted development vegetation clearing code Managing regulated regrowth vegetation; Department of Natural Resources and Mines. Effective 7 February 2020

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Appendix A: Detailed impact habitat quality assessment tables

Appendix A1: Impact assessment - brigalow TEC

Assessment table for impact to TEC	**Assessment unit:**	**Bench-mark**	AU1			**BM**	AU1			**BM**	AU1			**BM**	AU6		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:	**(BM)**	P1				P2				P33				P9		
	Regional ecosystem:	**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.4.8**	11.4.8		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	66	66%	3
Native plant species richness (No.): Trees		**3**	10	333%	5	**3**	7	233%	5	**3**	10	333%	5	**3**	11	367%	5
Shrubs		**5**	4	80%	2.5	**5**	3	60%	2.5	**5**	4	80%	2.5	**10**	7	70%	2.5
Grasses		**4**	2	50%	2.5	**4**	7	175%	5	**4**	6	150%	5	**9**	4	44%	2.5
Forbs		**8**	14	175%	5	**8**	10	125%	5	**8**	19	238%	5	**7**	14	200%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**14**	10	71%	5	**14**	9	64%	3	**14**	8	57%	3	**17**	7	41%	3
Tree sub-canopy height		**4**	0		0	**4**	0	0%	0	**4**	5	125%	5	**0**	4		
Average score					2.5				1.5				4.0				3.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**29**	71	245%	3	**29**	72	248%	3	**29**	23	79%	5	**40**	19	48%	2
Tree sub-canopy cover		**9**	0		0	**9**	0	0%	0	**9**	0	0%	0	**0**	0		
Average score					1.5				1.5				2.5				2.0
Shrub canopy cover (%):		**8**	0	0%	0	**8**	0	0%	0	**8**	23	288%	3	**5**	27	540%	3
Native perennial grass cover (%):		**8**	0	0%	0	**8**	25	313%	5	**8**	8	100%	5	**20**	7	35%	1
Organic litter (%):		**34**	42	124%	5	**34**	24	71%	5	**34**	17	50%	5	**37**	38	103%	5
Large trees/ha (euc./non-euc. combined)		**70**	8	11%	5	**70**	12	17%	5	**70**	6	9%	5	**70**	0	0%	0
Coarse woody debris (m/ha)		**1752**	43.5	2%	0	**1752**	55	3%	0	**1752**	570	33%	2	**813**	72	9%	0
Non-native plant cover (%):		**0**	0.4	40%	3	**0**	0.02	2%	10	**0**	0.33	33%	3	**0**	0.186	19%	5
Site condition score (-/80)					**45.0**				**56.5**				**65.0**				**42.0**
Size of patch (fragmented) (-/10)					5				5				5				5
Context (fragmented) (-/5)					2				0				0				2
Connectedness (fragmented) (-/5)					2				0				2				4
Site context score (-/20)					**7.0**				**5.0**				**7.0**				**11.0**
Assessment unit totals																	
AU site condition score (-/7):													4.07				3.70
AU site context score (-/3):													0.95				1.10
AU habitat quality score (-/10):													**5.02**				**4.80**
AU area within impact area:													7.20				0.40
Total impact area for this MNES:													7.60				7.60
Area weighting:													0.95				0.05
AU weighted HQS:													**4.75**				**0.25**

Appendix A2: Impact assessment - poplar box TEC

Assessment table for impact to TEC	**Assessment unit:**	**Bench-mark (BM)**	AU2			**BM**	AU2			**BM**	AU2		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P3				P4				P32		
	Regional ecosystem:	**11.3.2**	11.3.2				11.3.2				11.3.2		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**2**	8	400%	5	**2**	10	500%	5	**2**	7	350%	5
Shrubs		**2**	3	150%	5	**2**	2	100%	5	**2**	2	100%	5
Grasses		**9**	3	33%	2.5	**9**	4	44%	2.5	**9**	7	78%	2.5
Forbs		**17**	4	24%	0	**17**	9	53%	2.5	**17**	7	41%	2.5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**18**	13	72%	5	**18**	16	89%	5	**18**	15	83%	5
Tree sub-canopy height		**0**	0			**0**	0			**0**	0		
Average score					5.0				5.0				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**40**	32	80%	5	**40**	49	123%	5	**40**	54	135%	5
Tree sub-canopy cover		**0**	0			**0**	0			**0**	0		
Average score					5.0				5.0				5.0
Shrub canopy cover (%):		**2**	6	300%	3	**2**	0	0%	0	**2**	2	100%	5
Native perennial grass cover (%):		**35**	2	6%	0	**35**	0	0%	0	**35**	11	31%	1
Organic litter (%):		**30**	49	163%	5	**30**	27	90%	5	**30**	37	123%	5
Large trees/ha (euc./non-euc. combined)		**22**	4	18%	5	**22**	4	18%	5	**22**	4	18%	5
Coarse woody debris (m/ha)		**307**	36	12%	2	**307**	44	14%	2	**307**	50	16%	2
Non-native plant cover (%):		**0**	0.19	19%	5	**0**	0.46	46%	3	**0**	0.42	42%	3
Site condition score (-/80)					**57.5**				**55.0**				**61.0**
Size of patch (fragmented) (-/10)					10				10				10
Context (fragmented) (-/5)					5				4				5
Connectedness (fragmented) (-/5)					5				5				5
Site context score (-/20)					**20.0**				**19.0**				**20.0**
Assessment unit totals													
AU site condition score (-/7):													4.19
AU site context score (-/3):													2.95
AU habitat quality score (-/10):													**7.14**
AU area within impact area:													44.40
Total impact area for this MNES:													44.40
Area weighting:													1.00
AU weighted HQS:													**7.14**

Appendix A3: Impact assessment - ornamental snake habitat

Assessment table for impact to fauna habitat	**Assessment unit:**	**Bench-mark (BM)**	AU1			**BM**	AU1			**BM**	AU1			**BM**	AU9			**BM**	AU9			**BM**	AU9		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P1				P2				P34				P8				P14				P15		
	Regional ecosystem:	**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.4.8**	11.4.8			**11.4.8**	11.4.8			**11.4.8**	11.4.8		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	0	0%	0	**100**	100	100%	5	**100**	0	0%	0
Native plant species richness (No.): Trees		**3**	10	333%	5	**3**	7	233%	5	**3**	10	333%	5	**3**	1	33%	2.5	**3**	3	100%	5	**3**	1	33%	2.5
Shrubs		**5**	4	80%	2.5	**5**	3	60%	2.5	**5**	2	40%	2.5	**10**	7	70%	2.5	**10**	6	60%	2.5	**10**	5	50%	2.5
Grasses		**4**	2	50%	2.5	**4**	7	175%	5	**4**	1	25%	2.5	**9**	8	89%	2.5	**9**	2	22%	0	**9**	4	44%	2.5
Forbs		**8**	14	175%	5	**8**	10	125%	5	**8**	4	50%	2.5	**7**	17	243%	5	**7**	6	86%	2.5	**7**	8	114%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**14**	10	71%	5	**14**	9	64%	3	**14**	19	136%	5	**17**	0	0%	0	**17**	0	0%	0	**17**	0	0%	0
Tree sub-canopy height		**4**	0	0%	0	**4**	0	0%	0	**4**	12	300%	5	**0**	0		0	**0**	0		0	**0**	0		0
Average score					2.5				1.5				5				0.0				0.0				0.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**29**	71	245%	3	**29**	72	248%	3	**29**	35	121%	5	**40**	0	0%	0	**40**	0	0%	0	**40**	0	0%	0
Tree sub-canopy cover		**9**	0	0	0	**9**	0	0%	0	**9**	12	133%	5	**0**	0		0	**0**	0		0	**0**	0		0
Average score					1.5				1.5				5				0.0				0.0				0.0
Shrub canopy cover (%):		**8**	0	0%	0	**8**	0	0%	0	**8**	1	13%	3	**5**	34	680%	3	**5**	17	340%	3	**5**	23	460%	3
Native perennial grass cover (%):		**8**	0	0%	0	**8**	25	313%	5	**8**	0	0%	0	**20**	10	50%	3	**20**	0	0%	0	**20**	3	15%	1
Organic litter (%):		**34**	42	124%	5	**34**	24	71%	5	**34**	26	76%	5	**37**	18	49%	3	**37**	0	0%	0	**37**	16.2	44%	3
Large trees/ha (euc./non-euc. combined)		**70**	8	11%	5	**70**	12	17%	5	**70**	38	54%	10	**70**	0	0%	0	**70**	0	0%	0	**70**	0	0%	0
Coarse woody debris (m/ha)		**1752**	43.5	2%	0	**1752**	55	3%	0	**1752**	21.5	1%	0	**813**	6.5	1%	0	**813**	0	0%	0	**813**	2	0%	0
Non-native plant cover (%):		**0**	0.4	40%	3	**0**	0.02	2%	10	**0**	0	0%	10	**0**	0.21	21%	5	**0**	0.97	97%	0	**0**	0.386	39%	3
Quality/availability of food/foraging habitat (-/25)					9.09				15.91				0				5.45				12.27				2.72
Quality/availability of shelter (-/25)					8.33				16.67				0				5.00				13.33				1.67
Site condition score (-/130)					**62.42**				**89.08**				**75.50**				**36.95**				**43.61**				**26.89**
Size of patch (fragmented) (-/10)					5				5				10				0				0				0
Context (fragmented) (-/5)					2				0				5				0				2				0
Connectedness (fragmented) (-/5)					0				0				5				0				0				0
Species mobility capacity (-/25)					16.67				21.67				0				13.33				18.33				10.00
Threats to the species (-/25)					21.67				21.67				0				15.00				15.00				15.00
Site context score (-/70)					**45.33**				**48.33**				**20.00**				**28.33**				**35.33**				**25.00**
Assessment unit totals																									
AU site condition score (-/3):													1.48												0.83
AU site context score (-/3):													1.62												1.27
AU species stocking rate (-/4):													2.00												2.00
AU habitat quality score (-/10):													**5.11**												**4.09**
AU area within impact area:													0.30												41.70
Total impact area for this MNES:													42.00												42.00
Area weighting:													0.01												0.99
AU weighted HQS:													**0.04**												**4.06**

Appendix A4: Impact assessment - greater glider habitat

Assessment table for impact to fauna habitat	**Assessment unit:**	**Bench-mark (BM)**	AU4			**BM**	AU5			**BM**	AU5			**BM**	AU3			**BM**	AU3			**BM**	AU10		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P5				P6				P31				P7				P11				P35		
	Regional ecosystem:	**11.3.27b**	11.3.27b (wooded)			**11.3.4**	11.3.4			**11.3.4**	11.3.4			**11.3.25**	11.3.25			**11.3.25**	11.3.25			**11.3.27f**	11.3.27f (wooded)		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**1**	6	600%	5	**4**	7	175%	5	**4**	4	100%	5	**4**	11	275%	5	**4**	17	425%	5	**1**	5	500%	5
Shrubs		**1**	1	100%	5	**2**	3	150%	5	**2**	3	150%	5	**4**	4	100%	5	**4**	9	225%	5	**1**	3	300%	5
Grasses		**3**	1	33%	2.5	**7**	6	86%	2.5	**7**	3	43%	2.5	**8**	0	0%	0	**8**	5	63%	2.5	**3**	13	433%	5
Forbs		**6**	3	50%	2.5	**10**	6	60%	2.5	**10**	10	100%	5	**13**	4	31%	2.5	**13**	6	46%	2.5	**6**	19	317%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**16**	19	119%	5	**22**	15	68%	3	**22**	14	64%	3	**23**	17.5	76%	5	**23**	13	57%	3	**16**	16	100%	5
Tree sub-canopy height		**0**	12			**12**	9	75%	5	**12**	0		0	**11**	0	0%	0	**11**	0		0	**0**	0		
Average score					5.0				4.0				1.5				2.5				1.5				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**40**	18	45%	2	**17**	27	159%	5	**17**	45	265%	3	**34**	57	168%	5	34	21	62%	5	**40**	47	118%	5
Tree sub-canopy cover		**0**	6			**5**	7	140%	5	**5**	0	0	0	**12**	0	0	0	12	0	0	0	**0**	0		
Average score					2.0				5.0				1.5				2.5				2.5				5.0
Shrub canopy cover (%):		**0**	0			**1**	3	300%	3	**1**	0	0%	0	**7**	0	0%	0	**7**	26	371%	3	**0**	0		
Native perennial grass cover (%):		**3**	93	3100%	5	**43**	9	21%	1	**43**	15	35%	1	**35**	0	0%	0	**35**	4	11%	1	**3**	18	600%	5
Organic litter (%):		**15**	5	33%	3	**20**	50	250%	3	**20**	15	75%	5	**21**	44	210%	3	**21**	25	119%	5	**15**	47	313%	3
Large trees/ha (euc./non-euc. combined)		**28**	10	36%	5	**35**	2	6%	5	**35**	14	40%	5	**32**	14	44%	5	**32**	12	38%	5	**28**	2	7%	5
Coarse woody debris (m/ha)		**530**	37	7%	0	**384**	32	8%	0	**384**	18	5%	0	**473**	30	6%	0	**473**	60.5	13%	2	**530**	53.5	10%	2
Non-native plant cover (%):		**0**	0	0%	10	**0**	0	0%	10	**0**	0.6	60%	100%	**0**	0	0%	10	**0**	0.45	45%	100%	**0**	0.238	24%	5
Quality/availability of food/foraging habitat (-/25)					0				25				11.67				11.67				11.67				25.00
Quality/availability of shelter (-/25)					25				25				12.50				12.50				12.5				0
Site condition score (-/130)					**82**				**119**				**67.67**				**74.67**				**85.67**				**90.00**
Size of patch (fragmented) (-/10)					10				10				10				10				10				10
Context (fragmented) (-/5)					2				5				5				5				4				5
Connectedness (fragmented) (-/5)					5				5				5				5				5				5
Species mobility capacity (-/25)					18.75				18.75				25.00				18.75				18.75				25
Threats to the species (-/25)					0				0				0				0				0				
Site context score (-/70)					**35.75**				**38.75**				**45.00**				**30.75**				**37.75**				**45.00**
Assessment unit totals																									
AU site condition score (-/3):					1.73								1.88								1.64				1.85
AU site context score (-/3):					1.53								1.79								1.47				1.93
AU species stocking rate (-/4):					2.00								2.00								2.00				0.00
AU habitat quality score (-/10):					**5.26**								**5.67**								**5.11**				**3.77**
AU area within impact area:					2.40								4.90								6.90				0.10
Total impact area for this MNES:					93.60								93.60								93.60				93.60
Area weighting:					0.03								0.05								0.07				0.00
AU weighted HQS:					**0.13**								**0.30**								**0.38**				**0.00**

Assessment table for impact to fauna habitat	**Assessment unit:**	**Bench-mark (BM)**	AU1			**BM**	AU1			**BM**	AU1			**BM**	AU7			**BM**	AU7			**BM**	AU7		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P1				P2				P34				P10				P23				P32		
	Regional ecosystem:	**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.5.3**	11.5.3			**11.5.3**	11.5.3			**11.5.3**	11.5.3		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**3**	10	333%	5	**3**	7	233%	5	**3**	10	333%	5	**6**	7	117%	5	**6**	8	133%	5	**6**	7	117%	5
Shrubs		**5**	4	80%	2.5	**5**	3	60%	2.5	**5**	2	40%	2.5	**6**	3	50%	2.5	**6**	2	33%	2.5	**6**	2	33%	2.5
Grasses		**4**	2	50%	2.5	**4**	7	175%	5	**4**	1	25%	2.5	**6**	4	67%	2.5	**6**	1	17%	0	**6**	7	117%	5
Forbs		**8**	14	175%	5	**8**	10	125%	5	**8**	4	50%	2.5	**10**	13	130%	5	**10**	7	70%	2.5	**10**	7	70%	2.5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**14**	10	71%	5	**14**	9	64%	3	**14**	19	136%	5	**16**	12	75%	5	**16**	17.5	109%	5	**16**	15	94%	5
Tree sub-canopy height		**4**	0	0%	0	**4**	0	0%	0	**4**	12	300%	5	**0**	0		0	**0**	9		0	**0**	0		0
Average score					2.5				1.5				5.0				2.5				2.5				2.5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**29**	71	245%	3	**29**	72	248%	3	**29**	35	121%	5	**20**	50	250%	3	**20**	49	245%	3	**20**	54	270%	3
Tree sub-canopy cover		**9**	0	0%	0	**9**	0	0%	0	**9**	12	133%	5	**0**	0		0	**0**	9		0	**0**	0		0
Average score					1.5				1.5				5.0				1.5				1.5				1.5
Shrub canopy cover (%):		**8**	0	0%	0	**8**	0	0%	0	**8**	1	13%	3	**3**	7	233%	3	**3**	0	0%	0	**3**	2	67%	5
Native perennial grass cover (%):		**8**	0	0%	0	**8**	25	313%	5	**8**	0	0%	0	**19**	0	0%	0	**19**	0	0%	0	**19**	11	58%	3
Organic litter (%):		**34**	42	124%	5	**34**	24	71%	5	**34**	26	76%	5	**20**	17	85%	5	**20**	9	45%	3	**20**	37	185%	5
Large trees/ha (euc./non-euc. combined)		**70**	8	11%	5	**70**	12	17%	5	**70**	38	54%	10	**10**	8	80%	10	**10**	16	160%	15	**10**	4	40%	5
Coarse woody debris (m/ha)		**1752**	43.5	2%	0	**1752**	55	3%	0	**1752**	21.5	1%	0	**314**	19	6%	0	**314**	51	16%	2	**314**	50	16%	2
Non-native plant cover (%):		**0**	0.4	40%	3	**0**	0.02	2%	10	**0**	0	0%	10	**0**	0.82	82%	0	**0**	0.86	86%	0	**0**	0.42	42%	3
Quality/availability of food/foraging habitat (-/25)					0				0				11.67				11.67				11.67				25.00
Quality/availability of shelter (-/25)					25				12.5				12.50				25.00				12.50				12.50
Site condition score (-/130)					**70**				**69**				**99.67**				**86.67**				**71.17**				**92.50**
Size of patch (fragmented) (-/10)					5				5				10				10				10				10
Context (fragmented) (-/5)					2				0				5				4				5				5
Connectedness (fragmented) (-/5)					0				0				5				5				5				5
Species mobility capacity (-/25)					18.75				12.5				18.75				25				25				25
Threats to the species (-/25)					0				0				0				0				0				0
Site context score (-/70)					**25.75**				**17.5**				**38.75**				**44.00**				**45.00**				**45.00**
Assessment unit totals																									
AU site condition score (-/3):													1.57												1.74
AU site context score (-/3):													1.17												1.91
AU species stocking rate (-/4):													2.00												0.57
AU habitat quality score (-/10):													**4.75**												**4.23**
AU area within impact area:													0.30												20.30
Total impact area for this MNES:													93.60												93.60
Area weighting:													0.00												0.22
AU weighted HQS:													**0.02**												**0.92**

Assessment table for impact to fauna habitat	**Assessment unit:**	**Bench-mark (BM)**	AU2			**BM**	AU2			**BM**	AU2			**BM**	AU6			**BM**	AU6		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P3				P4				P33				P9				P12		
	Regional ecosystem:	**11.3.2**	11.3.2			**11.3.2**	11.3.2			**11.3.2**	11.3.2			**11.4.8**	11.4.8			**11.4.8**	11.4.8		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	66	66%	3	**100**	100	100%	5
Native plant species richness (No.): Trees		**2**	8	400%	5	**2**	10	500%	5	**2**	10	500%	5	**3**	11	367%	5	**3**	9	300%	5
Shrubs		**2**	3	150%	5	**2**	2	100%	5	**2**	4	200%	5	**10**	7	70%	2.5	**10**	2	20%	0
Grasses		**9**	3	33%	2.5	**9**	4	44%	2.5	**9**	6	67%	2.5	**9**	4	44%	2.5	**9**	4	44%	2.5
Forbs		**17**	4	24%	0	**17**	9	53%	2.5	**17**	19	112%	5	**7**	14	200%	5	**7**	9	129%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**18**	13	72%	5	**18**	16	89%	5	**18**	8	44%	3	**17**	7	41%	3	**17**	15	88%	5
Tree sub-canopy height		**0**	0		0	**0**	0		0	**0**	5		0	**0**	4			**0**	6		0
Average score					2.5				2.5				1.5				3.0				2.5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**40**	32	80%	5	**40**	49	123%	5	**40**	23	58%	5	**40**	19	48%	2	**40**	41	103%	5
Tree sub-canopy cover		**0**	0		0	**0**	0		0	**0**	0		0	**0**	0			**0**	0		0
Average score					2.5				2.5				2.5				2.0				2.5
Shrub canopy cover (%):		**2**	6	300%	3	**2**	0	0%	0	**2**	23	1150%	3	**5**	27	540%	3	**5**	4	80%	5
Native perennial grass cover (%):		**35**	2	6%	0	**35**	0	0%	0	**35**	8	23%	1	**20**	7	35%	1	**20**	0	0%	0
Organic litter (%):		**30**	49	163%	5	**30**	27	90%	5	**30**	17	57%	5	**37**	38	103%	5	**37**	53	143%	5
Large trees/ha (euc./non-euc. combined)		**22**	4	18%	5	**22**	4	18%	5	**22**	6	27%	5	**70**	0	0%	0	**70**	16	23%	5
Coarse woody debris (m/ha)		**307**	36	12%	2	**307**	44	14%	2	**307**	570	186%	5	**813**	72	9%	0	**813**	25.5	3%	0
Non-native plant cover (%):		**0**	0.19	19%	5	**0**	0.46	46%	3	**0**	0.33	33%	3	**0**	0.186	19%	5	**0**	0.34	34%	100%
Quality/availability of food/foraging habitat (-/25)					11.67				25.00				0.00				0				11.67
Quality/availability of shelter (-/25)					12.50				12.50				12.50				0				12.50
Site condition score (-/130)					**76.67**				**87.50**				**69.00**				**42.00**				**72.67**
Size of patch (fragmented) (-/10)					10				10				5				5				10
Context (fragmented) (-/5)					5				4				0				2				5
Connectedness (fragmented) (-/5)					5				5				2				4				5
Species mobility capacity (-/25)					18.75				25				18.75				18.75				18.75
Threats to the species (-/25)					0				0				0				0				0
Site context score (-/70)					**38.75**				**44.00**				**25.75**				**29.75**				**38.75**
Assessment unit totals																					
AU site condition score (-/3):													1.58								1.15
AU site context score (-/3):													1.55								1.47
AU species stocking rate (-/4):													2.00								2.00
AU habitat quality score (-/10):													**5.13**								**4.62**
AU area within impact area:													58.30								0.40
Total impact area for this MNES:													93.60								93.60
Area weighting:													0.62								0.00
AU weighted HQS:													**3.19**								**0.02**

Appendix A5: Impact assessment - koala habitat

Assessment table for impact to fauna habitat	**Assessment unit:**	**Bench-mark (BM)**	AU1			**BM**	AU1			**BM**	AU1			**BM**	AU2			**BM**	AU2			**BM**	AU2		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P1				P2				P34				P3				P4				P33		
	Regional ecosystem:	**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.3.2**	11.3.2			**11.3.2**	11.3.2			**11.3.2**	11.3.2		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**3**	10	333%	5	**3**	7	233%	5	**3**	10	333%	5	**2**	8	400%	5	**2**	10	500%	5	**2**	10	500%	5
Shrubs		**5**	4	80%	2.5	**5**	3	60%	2.5	**5**	2	40%	2.5	**2**	3	150%	5	**2**	2	100%	5	**2**	4	200%	5
Grasses		**4**	2	50%	2.5	**4**	7	175%	5	**4**	1	25%	2.5	**9**	3	33%	2.5	**9**	4	44%	2.5	**9**	6	67%	2.5
Forbs		**8**	14	175%	5	**8**	10	125%	5	**8**	4	50%	2.5	**17**	4	24%	0	**17**	9	53%	2.5	**17**	19	112%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**14**	10	71%	5	**14**	9	64%	3	**14**	19	136%	5	**18**	13	72%	5	**18**	16	89%	5	**18**	8	44%	3
Tree sub-canopy height		**4**	0	0%	0	**4**	0	0%	0	**4**	12	300%	5	**0**	0	0%	0	**0**	0	0%	0	**0**	5	0%	0
Average score					2.5				1.5				5				2.5				2.5				1.5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**29**	71	245%	3	**29**	72	248%	3	**29**	35	121%	5	**40**	32	80%	5	**40**	49	123%	5	**40**	23	58%	5
Tree sub-canopy cover		**9**	0	0	0	**9**	0	0%	0	**9**	12	133%	5	**0**	0	0%	0	**0**	0	0%	0	**0**	0	0%	0
Average score					1.5				1.5				5				2.5				2.5				2.5
Shrub canopy cover (%):		**8**	0	0%	0	**8**	0	0%	0	**8**	1	13%	3	**2**	6	300%	3	**2**	0	0%	0	**2**	23	1150%	3
Native perennial grass cover (%):		**8**	0	0%	0	**8**	25	313%	5	**8**	0	0%	0	**35**	2	6%	0	**35**	0	0%	0	**35**	8	23%	1
Organic litter (%):		**34**	42	124%	5	**34**	24	71%	5	**34**	26	76%	5	**30**	49	163%	5	**30**	27	90%	5	**30**	17	57%	5
Large trees/ha (euc./non-euc. combined)		**70**	8	11%	5	**70**	12	17%	5	**70**	38	54%	10	**22**	4	18%	5	**22**	4	18%	5	**22**	6	27%	5
Coarse woody debris (m/ha)		**1752**	43.5	2%	0	**1752**	55	3%	0	**1752**	21.5	1%	0	**307**	36	12%	2	**307**	44	14%	2	**307**	570	186%	5
Non-native plant cover (%):		**0**	0.4	40%	3	**0**	0.02	2%	10	**0**	0	0%	10	**0**	0.19	19%	5	**0**	0.46	46%	3	**0**	0.33	33%	3
Quality/availability of food/foraging habitat (-/25)					0				0				12.50				12.50				25.00				0
Quality/availability of shelter (-/25)					2.5				2.5				2.50				2.50				2.5				2.5
Site condition score (-/130)					**47.50**				**59.00**				**90.50**				**67.50**				**77.50**				**59.00**
Size of patch (fragmented) (-/10)					5				5				10				10				10				5
Context (fragmented) (-/5)					2				0				5				5				4				0
Connectedness (fragmented) (-/5)					0				0				5				5				5				2
Species mobility capacity (-/25)					25.0				25				25.00				25.0				25				23.00
Threats to the species (-/25)					25.0				25				25.00				25.0				25				25.00
Site context score (-/70)					**57.00**				**55.00**				**70.00**				**70.00**				**69.00**				**55.00**
Assessment unit totals																									
AU site condition score (-/3):													1.25												1.35
AU site context score (-/3):													2.60												2.76
AU species stocking rate (-/4):													2.00												2.00
AU habitat quality score (-/10):													**5.85**												**6.12**
AU area within impact area:													8.50												58.30
Total impact area for this MNES:													102.10												102.10
Area weighting:													0.08												0.57
AU weighted HQS:													**0.49**												**3.50**

Assessment table for impact to fauna habitat	**Assessment unit:**	**Bench-mark (BM)**	AU5			**BM**	AU5			**BM**	AU3			**BM**	AU3			**BM**	AU6			**BM**	AU6		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P6				P31				P7				P11				P9				P12		
	Regional ecosystem:	**11.3.4**	11.3.1			**11.3.4**	11.3.4			**11.3.25**	11.3.25			**11.3.25**	11.3.25			**11.4.8**	11.4.8			**11.4.8**	11.4.8		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	66	66%	3	**100**	100	100%	5
Native plant species richness (No.): Trees		**4**	7	175%	5	**4**	4	100%	5	**4**	11	275%	5	**4**	17	425%	5	**3**	11	367%	5	**3**	9	300%	5
Shrubs		**2**	3	150%	5	**2**	3	150%	5	**4**	4	100%	5	**4**	9	225%	5	**10**	7	70%	2.5	**10**	2	20%	0
Grasses		**7**	6	86%	2.5	**7**	3	43%	2.5	**8**	0	0%	0	**8**	5	63%	2.5	**9**	4	44%	2.5	**9**	4	44%	2.5
Forbs		**10**	6	60%	2.5	**10**	10	100%	5	**13**	4	31%	2.5	**13**	6	46%	2.5	**7**	14	200%	5	**7**	9	129%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**22**	15	68%	3	**22**	14	64%	3	**23**	17.5	76%	5	**23**	13	57%	3	**17**	7	41%	3	**17**	15	88%	5
Tree sub-canopy height		**12**	9	75%	5	**12**	0		0	**11**	0	0%	0	**11**	0		0	**0**	4			**0**	6		0
Average score					4.0				1.5				2.5				1.5				3.0				2.5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**17**	27	159%	5	**17**	45	265%	3	**34**	57	168%	5	**34**	21	62%	5	**40**	19	48%	2	**40**	41	103%	5
Tree sub-canopy cover		**5**	7	140%	5	**5**	0		0	**12**	0	0%	0	**12**	0		0	**0**	0			**0**	0		0
Average score					5.0				1.5				2.5				2.5				2.0				2.5
Shrub canopy cover (%):		**1**	3	300%	3	**1**	0	0%	0	**7**	0	0%	0	**7**	26	371%	3	**5**	27	540%	3	**5**	4	80%	5
Native perennial grass cover (%):		**43**	9	21%	1	**43**	15	35%	1	**35**	0	0%	0	**35**	4	11%	1	**20**	7	35%	1	**20**	0	0%	0
Organic litter (%):		**20**	50	250%	3	**20**	15	75%	5	**21**	44	210%	3	**21**	25	119%	5	**37**	38	103%	5	**37**	53	143%	5
Large trees/ha (euc./non-euc. combined)		**35**	2	6%	5	**35**	14	40%	5	**32**	14	44%	5	**32**	12	38%	5	**70**	0	0%	0	**70**	16	23%	5
Coarse woody debris (m/ha)		**384**	32	8%	0	**384**	18	5%	0	**473**	30	6%	0	**473**	60.5	13%	2	**813**	72	9%	0	**813**	25.5	3%	0
Non-native plant cover (%):		**0**	0	0%	10	**0**	0.6	60%	100%	**0**	0	0%	10	**0**				0	0.186	19%	5	0	0.34	34%	100%
Quality/availability of food/foraging habitat (-/25)					25.0				12.5				12.5				12.5				0				12.5
Quality/availability of shelter (-/25)					2.5				12.5				2.5				2.5				2.5				2.5
Site condition score (-/130)					**96.50**				**68.50**				**65.50**				**64.00**				**44.50**				**63.50**
Size of patch (fragmented) (-/10)					10				10				10				10				5				10
Context (fragmented) (-/5)					5				5				0				4				2				5
Connectedness (fragmented) (-/5)					5				5				2				5				4				5
Species mobility capacity (-/25)					25				25				25				25				23				25
Threats to the species (-/25)					25				25				25				25				25				25
Site context score (-/70)					**70.00**				**70.00**				**62.00**				**69.00**				**59.00**				**70.00**
Assessment unit totals																									
AU site condition score (-/3):									1.63								1.29								1.07
AU site context score (-/3):									3.00								2.81								2.75
AU species stocking rate (-/4):									2.00								2.00								2.00
AU habitat quality score (-/10):									**6.63**								**6.09**								**5.83**
AU area within impact area:									4.90								6.90								0.40
Total impact area for this MNES:									102.10								102.10								102.10
Area weighting:									0.05								0.07								0.01
AU weighted HQS:									**0.32**								**0.41**								**0.03**

Assessment table for impact to fauna habitat	**Assessment unit:**	**Bench-mark (BM)**	AU7			**BM**	AU7			**BM**	AU7			**BM**	AU4			**BM**	AU11			**BM**	AU10		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P10				P23				P32				P35				P36				P35		
	Regional ecosystem:	**11.5.3**	11.5.3			**11.5.3**	11.5.3			**11.5.3**	11.5.3			**11.3.27b**	11.3.27b (wooded)			**11.3.9**	11.3.9			**11.3.27f**	11.3.27f wooded		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**6**	7	117%	5	**6**	8	133%	5	**6**	7	117%	5	**1**	6	600%	5	**5**	8	160%	5	**1**	5	500%	5
Shrubs		**6**	3	50%	2.5	**6**	2	33%	2.5	**6**	2	33%	2.5	**1**	1	100%	5	**6**	2	33%	2.5	**1**	3	300%	5
Grasses		**6**	4	67%	2.5	**6**	1	17%	0	**6**	7	117%	5	**3**	1	33%	2.5	**9**	5	56%	2.5	**3**	13	433%	5
Forbs		**10**	13	130%	5	**10**	7	70%	2.5	**10**	7	70%	2.5	**6**	3	50%	2.5	**17**	10	59%	2.5	**6**	19	317%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**16**	12	75%	5	**16**	17.5	109%	5	**16**	15	94%	5	**16**	19	119%	5	**18**	15	83%	5	**16**	16	100%	5
Tree sub-canopy height		**0**	0		0	**0**	9		0	**0**	0		0	**0**	12			**0**	0			**0**	0		
Average score					2.5				2.5				2.5				5.0				5.0				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**20**	50	250%	3	**20**	49	245%	3	**20**	54	270%	3	**40**	18	45%	2	**28**	61	218%	3	**40**	47	118%	5
Tree sub-canopy cover		**0**	0		0	**0**	9		0	**0**	0		0	**0**	6			**0**	0			**0**	0		
Average score					1.5				1.5				1.5				2.0				3.0				5.0
Shrub canopy cover (%):		**3**	7	233%	3	**3**	0	0%	0	**3**	2	67%	5	**0**	0			**1**	0	0%	0	**0**	18	600%	5
Native perennial grass cover (%):		**19**	0	0%	0	**19**	0	0%	0	**19**	11	58%	3	**3**	93	3100%	5	**34**	6	18%	1	**3**	47	313%	3
Organic litter (%):		**20**	17	85%	5	**20**	9	45%	3	**20**	37	185%	5	**15**	5	33%	3	**32**	33	103%	5	**15**	2	7%	5
Large trees/ha (euc./non-euc. combined)		**10**	8	80%	10	**10**	16	160%	15	**10**	4	40%	5	**28**	10	36%	5	**15**	0	0%	0	**28**	53.5	10%	2
Coarse woody debris (m/ha)		**314**	19	6%	0	**314**	51	16%	2	**314**	50	16%	2	**530**	37	7%	0	**151**	41	27%	2	**530**	0.238	24%	5
Non-native plant cover (%):		**0**	0.82	82%	0	**0**	0.86	86%	0	**0**	0.42	42%	3	**0**	0	0%	10	**0**	0.02	2%	10	**0**	18	600%	5
Quality/availability of food/foraging habitat (-/25)					12.5				12.5				25.0				0				25.0				25.0
Quality/availability of shelter (-/25)					2.5				2.5				2.5				2.5				2.5				2.5
Site condition score (-/130)					**65.00**				**62.00**				**82.50**				**59.50**				**79.00**				**92.50**
Size of patch (fragmented) (-/10)					10				10				10				10				10				10
Context (fragmented) (-/5)					4				5				5				2				4				5
Connectedness (fragmented) (-/5)					5				5				5				5				5				5
Species mobility capacity (-/25)					25				25				25				25				25				25
Threats to the species (-/25)					25				25				25				25				25				25
Site context score (-/70)					**69.00**				**70.00**				**70.00**				**67.00**				**69.00**				**70.00**
Assessment unit totals																									
AU site condition score (-/3):													1.43				1.21				1.64				1.90
AU site context score (-/3):													2.99				2.87				2.96				3.00
AU species stocking rate (-/4):													0.57				2.00				0.00				0.00
AU habitat quality score (-/10):													**4.98**				**6.08**				**4.60**				**4.90**
AU area within impact area:													20.30				2.40				0.30				0.10
Total impact area for this MNES:													102.10				102.10				102.10				102.10
Area weighting:													0.20				0.02				0.00				0.00
AU weighted HQS:													**0.99**				**0.14**				**0.01**				**0.00**

Appendix B: Offset assessment tables

Appendix B1.1: Brigalow TEC offset assessment – current quality

Assessment table for TEC offset	**Assessment unit:**	**Bench-mark**	AU1			**BM**	AU1			**BM**	AU8 HVR			**BM**	AU8 HVR			**BM**	AU8 HVR		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:	**(BM)**	P16				P17				P28				P38				P41		
	Regional ecosystem:	**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.4.8**	11.48			**11.4.8**	11.48			**11.4.8**	11.48		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	0	0%	0
Native plant species richness (No.): Trees		**3**	11	367%	5	**3**	11	367%	5	**3**	3	100%	5	**3**	4	133%	5	**3**	3	100%	5
Shrubs		**5**	2	40%	2.5	**5**	3	60%	2.5	**10**	1	10%	0	**10**	1	10%	0	**10**	5	50%	2.5
Grasses		**4**	3	75%	2.5	**4**	7	175%	5	**9**	5	56%	2.5	**9**	8	89%	2.5	**9**	4	44%	2.5
Forbs		**8**	8	100%	5	**8**	9	113%	5	**7**	10	143%	5	**7**	4	57%	2.5	**7**	15	214%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**14**	13	93%	5	**14**	10	71%	5	**17**	4	24%	0	**17**	5	29%	3	**17**	5	29%	3
Tree sub-canopy height		**4**	0	0%	0	**4**	5	125%	5	**0**	0		0	**0**	0		0	**0**	0		0
Average score					2.5				8				0				1.5				1.5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**29**	89	307%	3	**29**	75	259%	3	**40**	60	150%	5	**40**	47	118%	5	**40**	62	155%	5
Tree sub-canopy cover		**9**	0	0%	0	**9**	0		0	**0**	0		0	**0**	0		0	**0**	0		0
Average score					1.5				1.5				2.5				2.5				2.5
Shrub canopy cover (%):		**8**	0	0%	0	**8**	7	88%	5	**5**	3	60%	5	**5**	2	40%	3	**5**	2	40%	3
Native perennial grass cover (%):		**8**	39	488%	5	**8**	13	163%	5	**20**	0	0%	0	**20**	7	35%	1	**20**	3	15%	1
Organic litter (%):		**34**	21.25	63%	5	**34**	2	6%	0	**37**	43	116%	5	**37**	15	41%	3	**37**	39.6	107%	5
Large trees/ha (euc./non-euc. combined)		**70**	6	9%	5	**70**	0	0%	0	**70**	0	0%	0	**70**	0	0%	0	**70**	0	0%	0
Coarse woody debris (m/ha)		**1752**	74	4%	0	**1752**	24	1%	0	**813**	19	2%	0	**813**	7.5	1%	0	**813**	44	5%	0
Non-native plant cover (%):		**0**	0.17	17%	5	**0**	0.19	19%	100%	**0**	0.06	6%	5	**0**	0	0%	10	**0**	0.014	1%	10
Site condition score (-/80)					**52.00**				**53.00**				**40.00**				**44.00**				**46.00**
Size of patch (fragmented) (-/10)					5				5				10				10				10
Context (fragmented) (-/5)					2				2				5				4				4
Connectedness (fragmented) (-/5)					0				2				5				5				5
Site context score (-/20)					**7.00**				**9.00**				**20.00**				**19.00**				**19.00**
Assessment unit totals																					
AU site condition score (-/7):									3.68												36.33
AU site context score (-/3):									1.20												19.33
AU habitat quality score (-/10):									**4.88**												**5.57**
AU area within offset area:									3.90												19.10
Total offset area for this MNES:									23.00												23.00
Area weighting:									0.17												0.83
AU weighted HQS:									**0.83**												**4.62**

Appendix B1.2: Brigalow TEC offset assessment – future quality without offset

Assessment table for TEC offset	**Assessment unit:**	**Bench-mark (BM)**	AU1			**BM**	AU1			**BM**	AU8 HVR			**BM**	AU8 HVR			**BM**	AU8 HVR		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P16				P17				P28				P38				P41		
	Regional ecosystem:	**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.4.8**	11.48			**11.4.8**	11.48			**11.4.8**	11.48		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	0	0%	0
Native plant species richness (No.): Trees		**3**	11	367%	5	**3**	11	367%	5	**3**	3	100%	5	**3**	4	133%	5	**3**	3	100%	5
	Shrubs	**5**	2	40%	2.5	**5**	3	60%	2.5	**10**	1	10%	0	**10**	1	10%	0	**10**	5	50%	2.5
	Grasses	**4**	3	75%	2.5	**4**	7	175%	5	**9**	5	56%	2.5	**9**	8	89%	2.5	**9**	4	44%	2.5
	Forbs	**8**	8	100%	5	**8**	9	113%	5	**7**	10	143%	5	**7**	4	57%	2.5	**7**	15	214%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**14**	13	93%	5	**14**	10	71%	5	**17**	4	24%	0	**17**	5	29%	3	**17**	5	29%	3
Tree sub-canopy height		**4**	0	0%	0	**4**	5	125%	5	**0**	0		0	**0**	0		0	**0**	0		0
Average score					2.5				8				0				1.5				1.5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**29**	89	307%	3	**29**	75	259%	3	**40**	60	150%	5	**40**	47	118%	5	**40**	62	155%	5
Tree sub-canopy cover		**9**	0	0%	0	**9**	0		0	**0**	0		0	**0**	0		0	**0**	0		0
Average score					1.5				1.5				2.5				2.5				2.5
Shrub canopy cover (%):		**8**	0	0%	0	**8**	7	88%	5	**5**	3	60%	5	**5**	2	40%	3	**5**	2	40%	3
Native perennial grass cover (%):		**8**	39	488%	5	**8**	13	163%	5	**20**	0	0%	0	**20**	7	35%	1	**20**	3	15%	1
Organic litter (%):		**34**	21.25	63%	5	**34**	2	6%	0	**37**	43	116%	5	**37**	15	41%	3	**37**	39.6	107%	5
Large trees/ha (euc./non-euc. combined)		**70**	6	9%	5	**70**	0	0%	0	**70**	0	0%	0	**70**	0	0%	0	**70**	0	0%	0
Coarse woody debris (m/ha)		**1752**	74	4%	0	**1752**	24	1%	0	**813**	19	2%	0	**813**	7.5	1%	0	**813**	44	5%	0
Non-native plant cover (%):		**0**	0.17	17%	5	**0**	0.19	19%	100%	**0**	0.06	6%	5	**0**	0	0%	10	**0**	0.014	1%	10
Site condition score (-/80)					**52.00**				**53.00**				**40.00**				**44.00**				**46.00**
Size of patch (fragmented) (-/10)					5				5				10				10				10
Context (fragmented) (-/5)					2				2				5				4				4
Connectedness (fragmented) (-/5)					0				2				5				5				5
Site context score (-/20)					**7.00**				**9.00**				**20.00**				**19.00**				**19.00**
Assessment unit totals																					
AU site condition score (-/7):									3.68												36.33
AU site context score (-/3):									1.20												19.33
AU habitat quality score (-/10):									**4.88**												**5.57**
AU area within offset area:									3.90												19.10
Total offset area for this MNES:									23.00												23.00
Area weighting:									0.17												0.83
AU weighted HQS:									**0.83**												**4.62**

Appendix B1.3: Brigalow TEC offset assessment – future quality with offset

Assessment table for TEC offset	**Assessment unit:**	**Bench-mark (BM)**	AU1			**BM**	AU1			**BM**	AU8 HVR			**BM**	AU8 HVR			**BM**	AU8 HVR		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P16				P17				P28				P38				P41		
	Regional ecosystem:	**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.4.8**	11.48			**11.4.8**	11.48			**11.4.8**	11.48		
Ecological condition indicator					**Score**				**Score**				**Score**				**Score**				**Score**
Recruitment of woody perennial species (%)		**100**			5	**100**			5	**100**			5	**100**			5	**100**			0
Native plant species richness (No.): Trees		**3**			5	**3**			5	**3**			5	**3**			5	**3**			5
Shrubs		**5**			2.5	**5**			2.5	**10**			0	**10**			0	**10**			2.5
Grasses		**4**			2.5	**4**			5	**9**			2.5	**9**			2.5	**9**			2.5
Forbs		**8**			5	**8**			5	**7**			5	**7**			2.5	**7**			5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**14**			5	**14**			5	**17**			0	**17**			3	**17**			3
Tree sub-canopy height		**4**			0	**4**			5	**0**			0	**0**			0	**0**			0
Average score					2.5				8				0				1.5				1.5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**29**			3	**29**			3	**40**			5	**40**			5	**40**			5
Tree sub-canopy cover		**9**			0	**9**			0	**0**			0	**0**			0	**0**			0
Average score					1.5				1.5				2.5				2.5				2.5
Shrub canopy cover (%):		**8**			0	**8**			5	**5**			5	**5**			3	**5**			3
Native perennial grass cover (%):		**8**			5	**8**			5	**20**			0	**20**			1	**20**			1
Organic litter (%):		**34**			5	**34**			0	**37**			5	**37**			3	**37**			5
Large trees/ha (euc./non-euc. combined)		**70**			5	**70**			0	**70**			0	**70**			0	**70**			0
Coarse woody debris (m/ha)		**1752**			0	**1752**			0	**813**			0	**813**			0	**813**			0
Non-native plant cover (%):		**0**			5	**0**			100%	**0**			5	**0**			10	**0**			10
Site condition score (-/80)					**52.00**				**53.00**				**40.00**				**44.00**				**46.00**
Size of patch (fragmented) (-/10)					5				5				10				10				10
Context (fragmented) (-/5)					2				2				5				4				4
Connectedness (fragmented) (-/5)					0				2				5				5				5
Site context score (-/20)					**7.00**				**9.00**				**20.00**				**19.00**				**19.00**
Assessment unit totals																					
AU site condition score (-/7):									4.86												51.75
AU site context score (-/3):									1.20												19.33
AU habitat quality score (-/10):									**6.06**												**7.11**
AU area within offset area:									3.90												19.10
Total offset area for this MNES:									23.00												23.00
Area weighting:									0.17												0.83
AU weighted HQS:									**1.03**												**5.90**

Appendix B2.1: Poplar box TEC offset assessment – current quality

Assessment table for offset for TEC	**Assessment unit:**	**Bench-mark (BM)**	AU2			**BM**	AU2		
	Property:		Meadowbrook				Meadowbrook		
	Assessment site no:		P18				P19		
	Regional ecosystem:	**11.3.2**	11.3.2			**11.3.2**	11.3.2		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**2**	4	200%	5	**2**	5	250%	5
Shrubs		**2**	0	0%	0	**2**	1	50%	2.5
Grasses		**9**	4	44%	2.5	**9**	5	56%	2.5
Forbs		**17**	12	71%	2.5	**17**	5	29%	2.5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**18**	16	89%	5	**18**	17.5	97%	5
Tree sub-canopy height		**0**	0			**0**	10		
Average score					5.0				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**40**	35	88%	5	**40**	60	150%	5
Tree sub-canopy cover		**0**	0			**0**	0		
Average score					5.0				5.0
Shrub canopy cover (%):		**2**	0	0%	0	**2**	2	100%	5
Native perennial grass cover (%):		**35**	14	40%	1	**35**	0	0%	0
Organic litter (%):		**30**	17	57%	5	**30**	46	153%	5
Large trees/ha (euc./non-euc. combined)		**22**	4	18%	5	**22**	8	36%	5
Coarse woody debris (m/ha)		**307**	13	4%	0	**307**	8	3%	0
Non-native plant cover (%):		**0**	0.48	48%	3	**0**	0.43	43%	100%
Site condition score (-/80)					**49.0**				**53.5**
Size of patch (fragmented) (-/10)					10				10
Context (fragmented) (-/5)					4				5
Connectedness (fragmented) (-/5)					5				5
Site context score (-/20)					**19.0**				**20.0**
Assessment unit totals									
AU site condition score (-/7):									3.61
AU site context score (-/3):									2.93
AU habitat quality score (-/10):									**6.53**
AU area within offset area:									299.00
Total offset area for this MNES:									299.00
Area weighting:									1.0
AU weighted HQS:									**6.53**

Appendix B2.2: Poplar box TEC offset assessment – future quality without offset

Assessment table for offset for TEC	**Assessment unit:**	**Bench-mark (BM)**	AU2			**BM**	AU2		
	Property:		Meadowbrook				Meadowbrook		
	Assessment site no:		P18				P19		
	Regional ecosystem:	**11.3.2**	11.3.2			**11.3.2**	11.3.2		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**2**	4	200%	5	**2**	5	250%	5
Shrubs		**2**	0	0%	0	**2**	1	50%	2.5
Grasses		**9**	4	44%	2.5	**9**	5	56%	2.5
Forbs		**17**	12	71%	2.5	**17**	5	29%	2.5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**18**	16	89%	5	**18**	17.5	97%	5
Tree sub-canopy height		**0**	0			**0**	10		
Average score					5.0				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**40**	35	88%	5	**40**	60	150%	5
Tree sub-canopy cover		**0**	0			**0**	0		
Average score					5.0				5.0
Shrub canopy cover (%):		**2**	0	0%	0	**2**	2	100%	5
Native perennial grass cover (%):		**35**	14	40%	1	**35**	0	0%	0
Organic litter (%):		**30**	17	57%	5	**30**	46	153%	5
Large trees/ha (euc./non-euc. combined)		**22**	4	18%	5	**22**	8	36%	5
Coarse woody debris (m/ha)		**307**	13	4%	0	**307**	8	3%	0
Non-native plant cover (%):		**0**	0.48	48%	3	**0**	0.43	43%	100%
Site condition score (-/80)					**49.0**				**53.5**
Size of patch (fragmented) (-/10)					10				10
Context (fragmented) (-/5)					4				5
Connectedness (fragmented) (-/5)					5				5
Site context score (-/20)					**19.0**				**20.0**
Assessment unit totals									
AU site condition score (-/7):									3.04
AU site context score (-/3):									2.93
AU habitat quality score (-/10):									**5.97**
AU area within offset area:									299.00
Total offset area for this MNES:									299.00
Area weighting:									1.0
AU weighted HQS:									**5.97**

Appendix B2.3: Poplar box TEC offset assessment – future quality with offset

Assessment table for offset for TEC	**Assessment unit:**	**Bench-mark (BM)**	AU2			**BM**	AU2		
	Property:		Meadowbrook				Meadowbrook		
	Assessment site no:		P18				P19		
	Regional ecosystem:	**11.3.2**	11.3.2			**11.3.2**	11.3.2		
Ecological condition indicator					**Score**				**Score**
Recruitment of woody perennial species (%)		**100**			5	**100**			5
Native plant species richness (No.): Trees		**2**			5	**2**			5
Shrubs		**2**			2.5	**2**			2.5
Grasses		**9**			2.5	**9**			2.5
Forbs		**17**			2.5	**17**			2.5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**18**			5	**18**			5
Tree sub-canopy height		**0**			5	**0**			5
Average score					5.0				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**40**			5	**40**			5
Tree sub-canopy cover		**0**				**0**			
Average score					5.0				5.0
Shrub canopy cover (%):		**2**			5	**2**			5
Native perennial grass cover (%):		**35**			1	**35**			1
Organic litter (%):		**30**			5	**30**			5
Large trees/ha (euc./non-euc. combined)		**22**			5	**22**			5
Coarse woody debris (m/ha)		**307**			2	**307**			20
Non-native plant cover (%):		**0**			3	**0**			3
Site condition score (-/80)					**63.5**				**63.5**
Size of patch (fragmented) (-/10)					10				10
Context (fragmented) (-/5)					5				5
Connectedness (fragmented) (-/5)					5				5
Site context score (-/20)					**20.0**				**20.0**
Assessment unit totals									
AU site condition score (-/7):									5.12
AU site context score (-/3):									3.00
AU habitat quality score (-/10):									**8.12**
AU area within offset area:									410.00
Total offset area for this MNES:									410.00
Area weighting:									1.0
AU weighted HQS:									**8.12**

Appendix B3.1: Ornamental snake habitat offset assessment – current quality

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark**	AU1			**BM**	AU1			**BM**	AU6			**BM**	AU8 HVR			**BM**	AU3		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:	**(BM)**	P16				P17				P26				P28				P20		
	Regional ecosystem:	**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.4.8**	11.4.8			**11.4.8**	11.4.8			**11.3.25**	11.3.25		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	50	50%	3
Native plant species richness (No.): Trees		**3**	11	367%	5	**3**	11	367%	5	**3**	13	433%	5	**3**	3	100%	5	**4**	11	275%	5
Shrubs		**5**	2	40%	2.5	**5**	3	60%	2.5	**10**	5	50%	2.5	**10**	1	10%	0	**4**	1	25%	2.5
Grasses		**4**	3	75%	2.5	**4**	7	175%	5	**9**	5	56%	2.5	**9**	5	56%	2.5	**8**	3	38%	2.5
Forbs		**8**	8	100%	5	**8**	9	113%	5	**7**	12	171%	5	**7**	10	143%	5	**13**	3	23%	0
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**14**	13	93%	5	**14**	10	71%	5	**17**	13.5	79%	5	**17**	4	24%	0	**23**	21	91%	5
Tree sub-canopy height		**4**	0	0%	0	**4**	5		0	**0**	8			**0**	0			**11**	0	0%	0
Average score					2.5				1.5				5.0				0.0				2.5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**29**	89	307%	3	**29**	75	259%	3	**40**	28	70%	5	**40**	60	150%	5	34	61	179%	5
Tree sub-canopy cover		**9**	0	0%	0	**9**	0		0	**0**	21			**0**	0			12	0	0%	0
Average score					1.5				1.5				5.0				5.0				2.5
Shrub canopy cover (%):		**8**	0	0%	0	**8**	7	88%	5	**5**	3	60%	5	**5**	3	60%	5	**7**	29	414%	3
Native perennial grass cover (%):		**8**	39	488%	5	**8**	13	163%	5	**20**	0	0%	0	**20**	0	0%	0	**35**	21	60%	3
Organic litter (%):		**34**	21.25	63%	5	**34**	2	6%	0	**37**	52.6	142%	5	**37**	43	116%	5	**21**	29.4	140%	5
Large trees/ha (euc./non-euc. combined)		**70**	6	9%	5	**70**	0	0%	0	**70**	0	0%	0	**70**	0	0%	0	**32**	38	119%	15
Coarse woody debris (m/ha)		**1752**	74	4%	0	**1752**	24	1%	0	**813**	104	13%	2	**813**	19	2%	0	**473**	36	8%	0
Non-native plant cover (%):		**0**	0.17	17%	5	**0**	0.19	19%	100%	**0**	0.234	23%	5	**0**	0.06	6%	5	**0**	0	0%	10
Quality/availability of food/foraging habitat (-/25)					9.09				15.91				25				25				0
Quality/availability of shelter (-/25)					8.33				16.67				25				25				0
Site condition score (-/130)					**69.42**				**78.08**				**107.00**				**92.50**				**64.00**
Size of patch (fragmented) (-/10)					5				5				10				10				10
Context (fragmented) (-/5)					2				2				5				5				5
Connectedness (fragmented) (-/5)					0				2				5				5				5
Species mobility capacity (-/25)					17.00				22.00				25				13				0
Threats to the species (-/25)					22.00				22.00				22				0				0
Site context score (-/70)					**45.00**				**52.00**				**67.00**				**33.00**				**20.00**
Assessment unit totals																					
AU site condition score (-/3):									1.52				2.24				2.02				1.25
AU site context score (-/3):									2.09				2.86				1.39				0.86
AU species stocking rate (-/4):									2.00				2.00				0.57				1.14
AU habitat quality score (-/10):									**5.61**				**7.10**				**3.98**				**3.25**
AU area within offset area:									3.90				20.30				55.58				12.28
Total offset area for this MNES:									92.00				92.00				92.00				92.00
Area weighting:									0.04				0.22				0.60				0.13
AU weighted HQS:									**0.24**				**1.57**				**2.40**				**0.43**

Appendix B3.2: Ornamental snake habitat offset assessment – future quality without offset

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark**	AU1			**BM**	AU1			**BM**	AU6			**BM**	AU8 HVR			**BM**	AU3		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:	**(BM)**	P16				P17				P26				P28				P20		
	Regional ecosystem:	**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.4.8**	11.4.8			**11.4.8**	11.4.8			**11.3.25**	11.3.25		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	0	0	0	**100**	50	50%	3
Native plant species richness (No.): Trees		**3**	11	367%	5	**3**	11	367%	5	**3**	13	433%	5	**3**	0	0	0	**4**	11	275%	5
Shrubs		**5**	2	40%	2.5	**5**	3	60%	2.5	**10**	5	50%	2.5	**10**	0	0	0	**4**	1	25%	2.5
Grasses		**4**	3	75%	2.5	**4**	7	175%	5	**9**	5	56%	2.5	**9**	0	0	0	**8**	3	38%	2.5
Forbs		**8**	8	100%	5	**8**	9	113%	5	**7**	12	171%	5	**7**	0	0	0	**13**	3	23%	0
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**14**	13	93%	5	**14**	10	71%	5	**17**				**17**	0	0	0	**23**	0	0	0
Tree sub-canopy height		**4**	0	0%	0	**4**	5		0	**0**	8			**0**	0	0	0	**11**	0	0%	0
Average score					2.5				1.5				0.0				0.0				2.5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**29**	89	307%	3	**29**	75	259%	3	**40**	28	70%	5	**40**	0	0	0	34	61	179%	5
Tree sub-canopy cover		**9**	0	0%	0	**9**	0		0	**0**	21			**0**	0	0	0	12	0	0%	0
Average score					1.5				1.5				5.0				0.0				2.5
Shrub canopy cover (%):		**8**	0	0%	0	**8**	7	88%	5	**5**	3	60%	5	**5**	0	0	0	**7**	29	414%	3
Native perennial grass cover (%):		**8**	39	488%	5	**8**	13	163%	5	**20**	0	0%	0	**20**	0	0	0	**35**	21	60%	3
Organic litter (%):		**34**	21.25	63%	5	**34**	2	6%	0	**37**	52.6	142%	5	**37**	0	0	0	**21**	29.4	140%	5
Large trees/ha (euc./non-euc. combined)		**70**	6	9%	5	**70**	0	0%	0	**70**	0	0%	0	**70**	0	0	0	**32**	38	119%	15
Coarse woody debris (m/ha)		**1752**	74	4%	0	**1752**	24	1%	0	**813**	104	13%	2	**813**	0	0	0	**473**	36	8%	0
Non-native plant cover (%):		**0**	0.17	17%	5	**0**	0.19	19%	100%	**0**	0.234	23%	5	**0**	0	0	0	**0**	0	0%	10
Quality/availability of food/foraging habitat (-/25)					9.09				15.91				25				10				0
Quality/availability of shelter (-/25)					8.33				16.67				25				10				0
Site condition score (-/130)					**69.42**				**78.08**				**97.00**				**20.00**				**54.00**
Size of patch (fragmented) (-/10)					5				5				10				10				10
Context (fragmented) (-/5)					2				2				5				5				5
Connectedness (fragmented) (-/5)					0				2				5				5				5
Species mobility capacity (-/25)					16.67				21.67				25				25				0
Threats to the species (-/25)					21.67				21.67				22				22				0
Site context score (-/70)					**45.33**				**52.33**				**66.67**				**66.67**				**20.00**
Assessment unit totals																					
AU site condition score (-/3):									1.52				2.24				0.46				1.25
AU site context score (-/3):									2.09				2.86				2.86				0.86
AU species stocking rate (-/4):									2.00				2.00				0.00				1.14
AU habitat quality score (-/10):									**5.61**				**7.10**				**3.32**				**3.25**
AU area within offset area:									3.90				20.30				55.52				12.28
Total offset area for this MNES:									92.00				92.00				92.00				92.00
Area weighting:									0.04				0.22				0.60				0.13
AU weighted HQS:									**0.24**				**1.57**				**2.00**				**0.43**

Appendix B3.3: Ornamental snake habitat offset assessment – future quality with offset

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark**	AU1			**BM**	AU1			**BM**	AU6			**BM**	AU8 HVR			**BM**	AU3		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:	**(BM)**	P16				P17				P26				P28				P20		
	Regional ecosystem:	**11.3.1**	11.3.1			**11.3.1**	11.3.1			**11.4.8**	11.4.8			**11.4.8**	11.4.8			**11.3.25**	11.3.25		
Ecological condition indicator					**Score**				**Score**				**Score**				**Score**				**Score**
Recruitment of woody perennial species (%)		**100**			5	**100**			5	**100**			5	**100**			5	**100**			5
Native plant species richness (No.): Trees		**3**			5	**3**			5	**3**			5	**3**			5	**4**			5
Shrubs		**5**			5	**5**			5	**10**			2.5	**10**			2.5	**4**			2.5
Grasses		**4**			5	**4**			5	**9**			2.5	**9**			2.5	**8**			2.5
Forbs		**8**			5	**8**			5	**7**			5	**7**			5	**13**			2.5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**14**			5	**14**			5	**17**			5	**17**			3	**23**			5
Tree sub-canopy height		**4**			0	**4**			0	**0**				**0**			0	**11**			0
Average score					5				5				5.0				3.0				2.5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**29**			3	**29**			3	**40**			5	**40**			5	34			5
Tree sub-canopy cover		**9**			0	**9**			0	**0**				**0**				12			0
Average score					1.5				1.5				5.0				5.0				2.5
Shrub canopy cover (%):		**8**			5	**8**			5	**5**			5	**5**			5	**7**			3
Native perennial grass cover (%):		**8**			5	**8**			5	**20**			3	**20**			3	**35**			3
Organic litter (%):		**34**			3	**34**			3	**37**			5	**37**			5	**21**			5
Large trees/ha (euc./non-euc. combined)		**70**			10	**70**			10	**70**			10	**70**			10	**32**			15
Coarse woody debris (m/ha)		**1752**			5	**1752**			5	**813**			5	**813**			5	**473**			5
Non-native plant cover (%):		**0**			5	**0**			5	**0**			5	**0**			5	**0**			10
Quality/availability of food/foraging habitat (-/25)					20.0				20.0				25				25				15
Quality/availability of shelter (-/25)					20.0				20.0				25				25				15
Site condition score (-/130)					**108.00**				**108.00**				**113.00**				**111.00**				**94.00**
Size of patch (fragmented) (-/10)					5				5				10				10				10
Context (fragmented) (-/5)					5				5				5				5				5
Connectedness (fragmented) (-/5)					5				5				5				5				5
Species mobility capacity (-/25)					19.00				19.00				25				25				25
Threats to the species (-/25)					22.00				22.00				25				22				25
Site context score (-/70)					**56.00**				**56.00**				**70.00**				**67.00**				**70.00**
Assessment unit totals																					
AU site condition score (-/3):									2.49				2.61				2.56				2.16
AU site context score (-/3):									2.39				3.00				2.86				3.00
AU species stocking rate (-/4):									2.00				2.00				0.57				2.00
AU habitat quality score (-/10):									**6.89**				**7.61**				**5.99**				**7.16**
AU area within offset area:									3.90				20.30				55.52				12.28
Total offset area for this MNES:									92.00				92.00				92.00				92.00
Area weighting:									0.04				0.22				0.60				0.13
AU weighted HQS:									**0.29**				**1.68**				**3.61**				**0.96**

Appendix B4.1: Greater glider habitat offset assessment – current quality

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark**	AU3			**BM**	AU4			**BM**	AU5			**BM**	AU2			**BM**	AU2			**BM**	AU11		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:	**(BM)**	P20				P21				P24				P18				P19				P25		
	Regional ecosystem:	**11.3.25**	11.3.25			**11.3.27b**	11.3.27b (wooded)			**11.3.4**	11.3.4			**11.3.2**	11.3.2			**11.3.2**	11.3.2			**11.3.9**	11.3.9		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	50	50%	3	**100**	50	50%	3	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**4**	11	275%	5	**1**	4	400%	5	**4**	11	275%	5	**2**	4	200%	5	**2**	5	250%	5	**5**	5	100%	5
Shrubs		**4**	1	25%	2.5	**1**	0	0%	0	**2**	2	100%	5	**2**	0	0%	0	**2**	1	50%	2.5	**6**	1	17%	0
Grasses		**8**	3	38%	2.5	**3**	1	33%	2.5	**7**	3	43%	2.5	**9**	4	44%	2.5	**9**	5	56%	2.5	**9**	5	56%	2.5
Forbs		**13**	3	23%	0	**6**	13	217%	5	**10**	5	50%	2.5	**17**	12	71%	2.5	**17**	5	29%	2.5	**17**	9	53%	2.5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**23**	21	91%	5	**16**	56	350%	5	**22**	11.5	52%	3	**18**	16	89%	5	**18**	17.5	97%	5	**18**	18	100%	5
Tree sub-canopy height		**11**	0	0%	0	**0**	50	50%	3	**12**	0	0%	0	**0**	0			**0**	10			**0**	0		
Average score					2.5				5.0				1.5				5				5				5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**34**	61	179%	5	**40**	56	140%	5	**17**	50	294%	3	**40**	35	88%	5	**40**	60	150%	5	**28**	32	114%	5
Tree sub-canopy cover		**12**	0	0%	0	**0**	0			**5**	19	380%	3	**0**	0			**0**	0			**0**	0		
Average score					2.5				5.0				3.0				5				5				5
Shrub canopy cover (%):		**7**	29	414%	3	**0**	0			**1**	0	0%	0	**2**	0	0%	0	**2**	2	100%	5	**1**	0	0%	0
Native perennial grass cover (%):		**35**	21	60%	3	**3**	0	0%	0	**43**	0	0%	0	**35**	14	40%	1	**35**	0	0%	0	**34**	84	247%	5
Organic litter (%):		**21**	29.4	140%	5	**15**	45	300%	3	**20**	64.6	323%	3	**30**	17	57%	5	**30**	46	153%	5	**32**	11	34%	3
Large trees/ha (euc./non-euc. combined)		**32**	38	119%	15	**28**	20	71%	10	**35**	8	23%	5	**22**	4	18%	5	**22**	8	36%	5	**15**	14	93%	10
Coarse woody debris (m/ha)		**473**	36	8%	0	**530**	26	5%	0	**384**	15	4%	0	**307**	13	4%	0	**307**	8	3%	0	**151**	9.5	6%	0
Non-native plant cover (%):		**0**	0	0%	10	**0**	0.23	23%	5	**0**	0.21	21%	5	**0**	0.48	48%	3	**0**	0.43	43%	3	**0**	0	0%	10
Quality/availability of food/foraging habitat (-/25)					11.67				0				11.67				25.0				25.0				0
Quality/availability of shelter (-/25)					25.00				25				12.50				12.5				25.0				12.5
Site condition score (-/130)					**100.67**				**78.50**				**70.67**				**86.50**				**105.50**				**75.50**
Size of patch (fragmented) (-/10)					10				10				10				10				10				10
Context (fragmented) (-/5)					5				4				5				4				5				5
Connectedness (fragmented) (-/5)					5				5				5				5				5				5
Species mobility capacity (-/25)					25				25				18.75				18.75				25				18.75
Threats to the species (-/25)					0				0				0				0				0				0
Site context score (-/70)					**45.00**				**44.00**				**38.75**				**37.75**				**45.00**				**38.75**
Assessment unit totals																									
AU site condition score (-/3):					2.09				1.58				1.42								1.98				1.51
AU site context score (-/3):					1.93				1.89				1.66								1.77				1.66
AU species stocking rate (-/4):					2.00				2.00				2.00								2.00				0.57
AU habitat quality score (-/10):					**6.02**				**5.47**				**5.08**								**5.76**				**3.74**
AU area within offset area:					29.09				5.76				38.83								288.83				2.99
Total offset area for this MNES:					365.00				365.00				365.00								365.00				365.00
Area weighting:					0.08				0.02				0.11								0.79				0.01
AU weighted HQS:					**0.48**				**0.09**				**0.54**								**4.55**				**0.03**

Appendix B4.2: Greater glider habitat offset assessment – future quality without offset

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark**	AU3			**BM**	AU4			**BM**	AU5			**BM**	AU2			**BM**	AU2			**BM**	AU11		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:	**(BM)**	P20				P21				P24				P18				P19				P25		
	Regional ecosystem:	**11.3.25**	11.3.25			**11.3.27b**	11.3.27b (wooded)			**11.3.4**	11.3.4			**11.3.2**	11.3.2			**11.3.2**	11.3.2			**11.3.9**	11.3.9		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	50	50%	3	**100**	50	50%	3	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**4**	11	275%	5	**1**	4	400%	5	**4**	11	275%	5	**2**	4	200%	5	**2**	5	250%	5	**5**	5	100%	5
Shrubs		**4**	1	25%	2.5	**1**	0	0%	0	**2**	2	100%	5	**2**	0	0%	0	**2**	1	50%	2.5	**6**	1	17%	0
Grasses		**8**	3	38%	2.5	**3**	1	33%	2.5	**7**	3	43%	2.5	**9**	4	44%	2.5	**9**	5	56%	2.5	**9**	5	56%	2.5
Forbs		**13**	3	23%	0	**6**	13	217%	5	**10**	5	50%	2.5	**17**	12	71%	2.5	**17**	5	29%	2.5	**17**	9	53%	2.5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**23**	21	91%	5	**16**	56	350%	5	**22**	11.5	52%	3	**18**	16	89%	5	**18**	17.5	97%	5	**18**	18	100%	5
Tree sub-canopy height		**11**	0	0%	0	**0**	50	50%	3	**12**	0	0%	0	**0**	0			**0**	10			**0**	0		
Average score					2.5				5.0				1.5				5				5				5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**34**	61	179%	5	**40**	56	140%	5	**17**	50	294%	3	**40**	35	88%	5	**40**	60	150%	5	**28**	32	114%	5
Tree sub-canopy cover		**12**	0	0%	0	**0**	0			**5**	19	380%	3	**0**	0			**0**	0			**0**	0		
Average score					2.5				5.0				3.0				5				5				5
Shrub canopy cover (%):		**7**	29	414%	3	**0**	0			**1**	0	0%	0	**2**	0	0%	0	**2**	2	100%	5	**1**	0	0%	0
Native perennial grass cover (%):		**35**	21	60%	3	**3**	0	0%	0	**43**	0	0%	0	**35**	14	40%	1	**35**	0	0%	0	**34**	84	247%	5
Organic litter (%):		**21**	29.4	140%	5	**15**	45	300%	3	**20**	64.6	323%	3	**30**	17	57%	5	**30**	46	153%	5	**32**	11	34%	3
Large trees/ha (euc./non-euc. combined)		**32**	38	119%	15	**28**	20	71%	10	**35**	8	23%	5	**22**	4	18%	5	**22**	8	36%	5	**15**	14	93%	10
Coarse woody debris (m/ha)		**473**	36	8%	0	**530**	26	5%	0	**384**	15	4%	0	**307**	13	4%	0	**307**	8	3%	0	**151**	9.5	6%	0
Non-native plant cover (%):		**0**	0	0%	10	**0**	0.23	23%	5	**0**	0.21	21%	5	**0**	0.48	48%	3	**0**	0.43	43%	3	**0**	0	0%	10
Quality/availability of food/foraging habitat (-/25)					11.67				0				11.67				25.0				25.0				0
Quality/availability of shelter (-/25)					25.00				25				12.50				12.5				25.0				12.5
Site condition score (-/130)					**100.67**				**78.50**				**70.67**				**86.50**				**105.50**				**75.50**
Size of patch (fragmented) (-/10)					10				10				10				10				10				10
Context (fragmented) (-/5)					5				4				5				4				5				5
Connectedness (fragmented) (-/5)					5				5				5				5				5				5
Species mobility capacity (-/25)					25				25				18.75				18.75				25				18.75
Threats to the species (-/25)					0				0				0				0				0				0
Site context score (-/70)					**45.00**				**44.00**				**38.75**				**37.75**				**45.00**				**38.75**
Assessment unit totals																									
AU site condition score (-/3):					2.09				1.58				1.42								1.98				1.51
AU site context score (-/3):					1.93				1.89				1.66								1.77				1.66
AU species stocking rate (-/4):					2.00				2.00				2.00								2.00				0.57
AU habitat quality score (-/10):					**6.02**				**5.47**				**5.08**								**5.76**				**3.74**
AU area within offset area:					29.09				5.76				38.83								288.83				2.99
Total offset area for this MNES:					365.00				365.00				365.00								365.00				365.00
Area weighting:					0.08				0.02				0.11								0.79				0.01
AU weighted HQS:					**0.48**				**0.09**				**0.54**								**4.55**				**0.03**

Appendix B4.3: Greater glider habitat offset assessment – future quality with offset

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark (BM)**	AU3			**BM**	AU4			**BM**	AU5			**BM**	AU2			**BM**	AU2			**BM**	AU11		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P20				P21				P24				P18				P19				P25		
	Regional ecosystem:	**11.3.25**	11.3.25			**11.3.27b**	11.3.27b (wooded)			**11.3.4**	11.3.4			**11.3.2**	11.3.2			**11.3.2**	11.3.2			**11.3.9**	11.3.9		
Ecological condition indicator					**Score**				**Score**				**Score**				**Score**				**Score**				**Score**
Recruitment of woody perennial species (%)		**100**			5	**100**			3	**100**			5	**100**			5	**100**			5	**100**			5
Native plant species richness (No.): Trees		**4**			5	**1**			5	**4**			5	**2**			5	**2**			5	**5**			5
Shrubs		**4**			2.5	**1**			2.5	**2**			5	**2**			2.5	**2**			2.5	**6**			2.5
Grasses		**8**			2.5	**3**			2.5	**7**			2.5	**9**			5.0	**9**			5.0	**9**			2.5
Forbs		**13**			2.5	**6**			5	**10**			2.5	**17**			2.5	**17**			2.5	**17**			2.5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**23**			5	**16**			5	**22**			3	**18**			5	**18**			5	**18**			5
Tree sub-canopy height		**11**			0	**0**				**12**			0	**0**				**0**				**0**			
Average score					2.5				5.0				1.5				5				5				5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**34**			5	**40**			5	**17**			3	**40**			5	**40**			5	**28**			5
Tree sub-canopy cover		**12**			0	**0**				**5**			3	**0**				**0**				**0**			
Average score					2.5				5.0				3.0				5				5				5
Shrub canopy cover (%):		**7**			3	**0**			3	**1**			3	**2**			3	**2**			3	**1**			0
Native perennial grass cover (%):		**35**			3	**3**			3	**43**			3	**35**			3	**35**			3	**34**			5
Organic litter (%):		**21**			5	**15**			3	**20**			3	**30**			5	**30**			5	**32**			3
Large trees/ha (euc./non-euc. combined)		**32**			15	**28**			10	**35**			5	**22**			5	**22**			5	**15**			10
Coarse woody debris (m/ha)		**473**			5	**530**			5	**384**			3	**307**			5	**307**			5	**151**			2
Non-native plant cover (%):		**0**			10	**0**			5	**0**			5	**0**			5	**0**			5	**0**			10
Quality/availability of food/foraging habitat (-/25)					25.00				25				12				25.0				25.0				15
Quality/availability of shelter (-/25)					25.00				25				13				19.0				25.0				13
Site condition score (-/130)					**114.00**				**107.00**				**72.00**				**87.00**				**106.00**				**85.00**
Size of patch (fragmented) (-/10)					10				10				10				10				10				10
Context (fragmented) (-/5)					5				5				5				4				5				5
Connectedness (fragmented) (-/5)					5				5				5				5				5				5
Species mobility capacity (-/25)					25				25				22				25				23				22
Threats to the species (-/25)					18				18				18				25				0				18
Site context score (-/70)					**63.00**				**63.00**				**60.00**				**69.00**				**47.00**				**60.00**
Assessment unit totals																									
AU site condition score (-/3):					2.62				2.47				1.67								2.30				1.96
AU site context score (-/3):					2.70				2.68				2.57								2.54				2.57
AU species stocking rate (-/4):					2.29				2.29				2.29								2.29				0.86
AU habitat quality score (-/10):					**7.60**				**7.43**				**6.52**								**7.13**				**5.38**
AU area within offset area:					29.09				5.76				38.83								288.33				2.99
Total offset area for this MNES:					365.00				365.00				365.00								365.00				365.00
Area weighting:					0.08				0.02				0.11								0.79				0.01
AU weighted HQS:					**0.61**				**0.12**				**0.69**								**5.63**				**0.04**

Appendix B5.1: Koala habitat offset assessment – current quality

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark (BM)**	AU2			**BM**	AU2			**BM**	AU3			**BM**	AU4		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P18				P19				P20				P21		
	Regional ecosystem:	**11.3.2**	11.3.2			**11.3.2**	11.3.2			**11.3.25**	11.3.25			**11.3.27b**	11.3.27b (wooded)		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	50	50%	3	**100**	50	50%	3
Native plant species richness (No.):	Trees	**2**	4	200%	5	**2**	5	250%	5	**4**	11	275%	5	**1**	4	400%	5
	Shrubs	**2**	0	0%	0	**2**	1	50%	2.5	**4**	1	25%	2.5	**1**	0	0%	0
	Grasses	**9**	4	44%	2.5	**9**	5	56%	2.5	**8**	3	38%	2.5	**3**	1	33%	2.5
	Forbs	**17**	12	71%	2.5	**17**	5	29%	2.5	**13**	3	23%	0	**6**	13	217%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**18**	16	89%	5	**18**	17.5	97%	5	**23**	21	91%	5	**16**	56	350%	5
Tree sub-canopy height		**0**	0			**0**	10			**11**	0	0%	0	**0**	0		
Average score					5.0				5.0				2.5				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**40**	35	88%	5	**40**	60	150%	5	**34**	0	0%	0	**40**	56	140%	5
Tree sub-canopy cover		**0**	0			**0**	0			**12**	0	0%	0	**0**	0		
Average score					5.0				5.0				0				5.0
Shrub canopy cover (%):		**2**	0	0%	0	**2**	2	100%	5	**7**	29	414%	3	**0**	0	0%	0
Native perennial grass cover (%):		**35**	14	40%	1	**35**	0	0%	0	**35**	21	60%	3	**3**	45	300%	3
Organic litter (%):		**30**	17	57%	5	**30**	46	153%	5	**21**	29.4	140%	5	**15**	20	71%	10
Large trees/ha (euc./non-euc. combined)		**22**	4	18%	5	**22**	8	36%	5	**32**	38	119%	15	**28**	26	5%	0
Coarse woody debris (m/ha)		**307**	13	4%	0	**307**	8	3%	0	**473**	36	8%	0	**530**	0.23	23%	5
Non-native plant cover (%):		**0**	0.48	48%	3	**0**	0.43	43%	3	**0**	0	0%	10	**0**	0	0%	0
Quality/availability of food/foraging habitat (-/25)					25.0				25.0				12.5				0
Quality/availability of shelter (-/25)					2.5				12.5				2.5				2.5
Site condition score (-/130)					**76.50**				**93.00**				**69.00**				**46.00**
Size of patch (fragmented) (-/10)					10				10				10				10
Context (fragmented) (-/5)					4				5				5				4
Connectedness (fragmented) (-/5)					5				5				5				5
Species mobility capacity (-/25)					25				25				25				25
Threats to the species (-/25)					13				13				13				13
Site context score (-/70)					**57.00**				**58.00**				**58.00**				**57.00**
Assessment unit totals																	
AU site condition score (-/3):									1.73				1.59				1.06
AU site context score (-/3):									2.44				2.46				2.42
AU species stocking rate (-/4):									1.71				2.00				2.00
AU habitat quality score (-/10):									**5.88**				**6.06**				**5.48**
AU area within offset area:									289.90				29.09				5.76
Total offset area for this MNES:									480.00				480.00				480.00
Area weighting:									0.60				0.06				0.01
AU weighted HQS:									**3.55**				**0.37**				**0.07**

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark (BM)**	AU5			**BM**	AU11			**BM**	AU7		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P24				P25				P27		
	Regional ecosystem:	**11.3.4**	11.3.4			**11.5.3**	11.5.3			**11.3.9**	11.3.9		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**4**	11	275%	5	**6**	9	150%	5	**5**	5	100%	5
Shrubs		**2**	2	100%	5	**6**	4	67%	2.5	**6**	1	17%	0
Grasses		**7**	3	43%	2.5	**6**	10	167%	5	**9**	5	56%	2.5
Forbs		**10**	5	50%	2.5	**10**	13	130%	5	**17**	9	53%	2.5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**22**	0	0%	0	**16**	13.5	84%	5	**18**	0	0%	0
Tree sub-canopy height		**12**	0	0%	0	**0**	9			**0**	0		
Average score					0				5.0				0.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**17**	50	294%	3	**20**	0	0%	0	**28**	32	114%	5
Tree sub-canopy cover		**5**	19	380%	3	**0**	4			**0**	0		
Average score					3.0				0.0				5.0
Shrub canopy cover (%):		**1**	0	0%	0	**3**	1	33%	3	**1**	0	0%	0
Native perennial grass cover (%):		**43**	0	0%	0	**19**	35	184%	5	**34**	84	247%	5
Organic litter (%):		**20**	64.6	323%	3	**20**	32	160%	5	**32**	11	34%	3
Large trees/ha (euc./non-euc. combined)		**35**	8	23%	5	**10**	0	0%	0	**15**	14	93%	10
Coarse woody debris (m/ha)		**384**	15	4%	0	**314**	15	5%	0	**151**	9.5	6%	0
Non-native plant cover (%):		**0**	0.21	21%	5	**0**	0.13	13%	5	**0**	0	0%	10
Quality/availability of food/foraging habitat (-/25)					12.5				12.5				0
Quality/availability of shelter (-/25)					2.5				2.5				2.5
Site condition score (-/130)					**52.50**				**63.50**				**55.50**
Size of patch (fragmented) (-/10)					10				10				10
Context (fragmented) (-/5)					5				5				5
Connectedness (fragmented) (-/5)					5				5				5
Species mobility capacity (-/25)					25				25				25
Threats to the species (-/25)					13				13				13
Site context score (-/70)					**58.00**				**58.00**				**58.00**
Assessment unit totals													
AU site condition score (-/3):					1.21				1.47				1.28
AU site context score (-/3):					2.46				2.46				2.46
AU species stocking rate (-/4):					1.71				1.71				0.00
AU habitat quality score (-/10):					**5.39**				**5.64**				**3.75**
AU area within offset area:					38.83				113.43				2.99
Total offset area for this MNES:					480.00				480.00				480.00
Area weighting:					0.08				0.24				0.01
AU weighted HQS:					**0.44**				**1.33**				**0.02**

Appendix B5.2: Koala habitat offset assessment – future quality without offset

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark**	AU2			**BM**	AU2			**BM**	AU3			**BM**	AU4		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:	**(BM)**	P18				P19				P20				P21		
	Regional ecosystem:	**11.3.2**	11.3.2			**11.3.2**	11.3.2			**11.3.25**	11.3.25			**11.3.27b**	11.3.27b (wooded)		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	50	50%	3	**100**	50	50%	3
Native plant species richness (No.): Trees		**2**	4	200%	5	**2**	5	250%	5	**4**	11	275%	5	**1**	4	400%	5
Shrubs		**2**	0	0%	0	**2**	1	50%	2.5	**4**	1	25%	2.5	**1**	0	0%	0
Grasses		**9**	4	44%	2.5	**9**	5	56%	2.5	**8**	3	38%	2.5	**3**	1	33%	2.5
Forbs		**17**	12	71%	2.5	**17**	5	29%	2.5	**13**	3	23%	0	**6**	13	217%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**18**	16	89%	5	**18**	17.5	97%	5	**23**	21	91%	5	**16**	56	350%	5
Tree sub-canopy height		**0**	0			**0**	10			**11**	0	0%	0	**0**	0		
Average score					5.0				5.0				2.5				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**40**	35	88%	5	**40**	60	150%	5	**34**	0	0%	0	**40**	56	140%	5
Tree sub-canopy cover		**0**	0			**0**	0			**12**	0	0%	0	**0**	0		
Average score					5.0				5.0				0				5.0
Shrub canopy cover (%):		**2**	0	0%	0	**2**	2	100%	5	**7**	29	414%	3	**0**	0	0%	0
Native perennial grass cover (%):		**35**	14	40%	1	**35**	0	0%	0	**35**	21	60%	3	**3**	45	300%	3
Organic litter (%):		**30**	17	57%	5	**30**	46	153%	5	**21**	29.4	140%	5	**15**	20	71%	10
Large trees/ha (euc./non-euc. combined)		**22**	4	18%	5	**22**	8	36%	5	**32**	38	119%	15	**28**	26	5%	0
Coarse woody debris (m/ha)		**307**	13	4%	0	**307**	8	3%	0	**473**	36	8%	0	**530**	0.23	23%	5
Non-native plant cover (%):		**0**	0.48	48%	3	**0**	0.43	43%	3	**0**	0	0%	10	**0**	0	0%	0
Quality/availability of food/foraging habitat (-/25)					25.0				25.0				12.5				0
Quality/availability of shelter (-/25)					2.5				12.5				2.5				2.5
Site condition score (-/130)					**76.50**				**93.00**				**69.00**				**46.00**
Size of patch (fragmented) (-/10)					10				10				10				10
Context (fragmented) (-/5)					4				5				5				4
Connectedness (fragmented) (-/5)					5				5				5				5
Species mobility capacity (-/25)					25				25				25				25
Threats to the species (-/25)					13				13				13				13
Site context score (-/70)					**57.00**				**58.00**				**58.00**				**57.00**
Assessment unit totals																	
AU site condition score (-/3):									1.73				1.59				1.06
AU site context score (-/3):									2.44				2.46				2.42
AU species stocking rate (-/4):									1.71				2.00				2.00
AU habitat quality score (-/10):									**5.88**				**6.06**				**5.48**
AU area within offset area:									289.90				29.09				5.76
Total offset area for this MNES:									480.00				480.00				480.00
Area weighting:									0.60				0.06				0.01
AU weighted HQS:									**3.55**				**0.37**				**0.07**

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark (BM)**	AU5			**BM**	AU11			**BM**	AU7		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P24				P25				P27		
	Regional ecosystem:	**11.3.4**	11.3.4			**11.5.3**	11.5.3			**11.3.9**	11.3.9		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**4**	11	275%	5	**6**	9	150%	5	**5**	5	100%	5
Shrubs		**2**	2	100%	5	**6**	4	67%	2.5	**6**	1	17%	0
Grasses		**7**	3	43%	2.5	**6**	10	167%	5	**9**	5	56%	2.5
Forbs		**10**	5	50%	2.5	**10**	13	130%	5	**17**	9	53%	2.5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**22**	0	0%	0	**16**	13.5	84%	5	**18**	0	0%	0
Tree sub-canopy height		**12**	0	0%	0	**0**	9			**0**	0		
Average score					0				5.0				0.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**17**	50	294%	3	**20**	0	0%	0	**28**	32	114%	5
Tree sub-canopy cover		**5**	19	380%	3	**0**	4			**0**	0		
Average score					3.0				0.0				5.0
Shrub canopy cover (%):		**1**	0	0%	0	**3**	1	33%	3	**1**	0	0%	0
Native perennial grass cover (%):		**43**	0	0%	0	**19**	35	184%	5	**34**	84	247%	5
Organic litter (%):		**20**	64.6	323%	3	**20**	32	160%	5	**32**	11	34%	3
Large trees/ha (euc./non-euc. combined)		**35**	8	23%	5	**10**	0	0%	0	**15**	14	93%	10
Coarse woody debris (m/ha)		**384**	15	4%	0	**314**	15	5%	0	**151**	9.5	6%	0
Non-native plant cover (%):		**0**	0.21	21%	5	**0**	0.13	13%	5	**0**	0	0%	10
Quality/availability of food/foraging habitat (-/25)					12.5				12.5				0
Quality/availability of shelter (-/25)					2.5				2.5				2.5
Site condition score (-/130)					**52.50**				**63.50**				**55.50**
Size of patch (fragmented) (-/10)					10				10				10
Context (fragmented) (-/5)					5				5				5
Connectedness (fragmented) (-/5)					5				5				5
Species mobility capacity (-/25)					25				25				25
Threats to the species (-/25)					13				13				13
Site context score (-/70)					**58.00**				**58.00**				**58.00**
Assessment unit totals													
AU site condition score (-/3):					1.21				1.47				1.28
AU site context score (-/3):					2.46				2.46				2.46
AU species stocking rate (-/4):					1.71				1.71				0.00
AU habitat quality score (-/10):					**5.39**				**5.64**				**3.75**
AU area within offset area:					38.83				113.43				2.99
Total offset area for this MNES:					480.00				480.00				480.00
Area weighting:					0.08				0.24				0.01
AU weighted HQS:					**0.44**				**1.33**				**0.02**

Appendix B5.3: Koala habitat offset assessment – future quality with offset

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark**	AU2			**BM**	AU2			**BM**	AU3			**BM**	AU4		
	Property:	**(BM)**	Meadowbrook				Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P18				P19				P20				P21		
	Regional ecosystem:	**11.3.2**	11.3.2			**11.3.2**	11.3.2			**11.3.25**	11.3.25			**11.3.27b**	11.3.27b (wooded)		
Ecological condition indicator					**Score**				**Score**				**Score**				**Score**
Recruitment of woody perennial species (%)		**100**			5	**100**			5	**100**			5	**100**			5
Native plant species richness (No.): Trees		**2**			5	**2**			5	**4**			5	**1**			5
Shrubs		**2**			1.25	**2**			1.25	**4**			2.5	**1**			2.5
Grasses		**9**			2.5	**9**			2.5	**8**			2.5	**3**			2.5
Forbs		**17**			2.5	**17**			2.5	**13**			3	**6**			5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**18**			5	**18**			5	**23**			5	**16**			5
Tree sub-canopy height		**0**			0	**0**			0	**11**			5	**0**			5
Average score					2.5				5.0				5.0				2.5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**40**			0	**40**			0	**34**			5	**40**			5
Tree sub-canopy cover		**0**			5	**0**			5	**12**			3	**0**			3
Average score					2.5				2.5				4.0				4.0
Shrub canopy cover (%):		**2**			2.5	**2**			2.5	**7**			3	**0**			3
Native perennial grass cover (%):		**35**			0.5	**35**			0.5	**35**			3	**3**			3
Organic litter (%):		**30**			5	**30**			5	**21**			5	**15**			3
Large trees/ha (euc./non-euc. combined)		**22**			5	**22**			5	**32**			15	**28**			10
Coarse woody debris (m/ha)		**307**			0	**307**			0	**473**			3	**530**			3
Non-native plant cover (%):		**0**			3	**0**			3	**0**			10	**0**			5
Quality/availability of food/foraging habitat (-/25)					20.0				20.0				20.0				20.0
Quality/availability of shelter (-/25)					20.0				20.0				20.0				20.0
Site condition score (-/130)					**82.25**				**82.25**				**115.0**				**100.0**
Size of patch (fragmented) (-/10)					10				10				10				10
Context (fragmented) (-/5)					5				5				5				5
Connectedness (fragmented) (-/5)					5				5				5				5
Species mobility capacity (-/25)					25				25				25				25
Threats to the species (-/25)					25				25				25				25
Site context score (-/70)					**70.0**				**70.0**				**70.0**				**70.0**
Assessment unit totals																	
AU site condition score (-/3):									1.90				2.65				2.31
AU site context score (-/3):									3.00				3.00				3.00
AU species stocking rate (-/4):									2.57				2.57				2.57
AU habitat quality score (-/10):									**7.47**				**8.23**				**7.88**
AU area within offset area:									289.90				29.09				5.76
Total offset area for this MNES:									480.00				480.00				480.00
Area weighting:									0.60				0.06				0.01
AU weighted HQS:									**4.51**				**0.50**				**0.09**

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark (BM)**	AU5			**BM**	AU11			**BM**	AU7		
	Property:		Meadowbrook				Meadowbrook				Meadowbrook		
	Assessment site no:		P24				P25				P27		
	Regional ecosystem:	**11.3.4**	11.3.4			**11.5.3**	11.5.3			**11.3.9**	11.3.9		
Ecological condition indicator					**Score**				**Score**				**Score**
Recruitment of woody perennial species (%)		**100**			5	**100**			5	**100**			5
Native plant species richness (No.): Trees		**4**			5	**6**			5	**5**			5
Shrubs		**2**			2.5	**6**			2.5	**6**			2.5
Grasses		**7**			2.5	**6**			2.5	**9**			5
Forbs		**10**			2.5	**10**			2.5	**17**			5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**22**			3	**16**			5	**18**			5
Tree sub-canopy height		**12**			5	**0**			5	**0**			3
Average score					4.0				5.0				4.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**17**			3	**20**			5	**28**			3
Tree sub-canopy cover		**5**			3	**0**			3	**0**			3
Average score					3.0				4.0				3.0
Shrub canopy cover (%):		**1**			3	**3**			3	**1**			3
Native perennial grass cover (%):		**43**			3	**19**			3	**34**			5
Organic litter (%):		**20**			3	**20**			3	**32**			5
Large trees/ha (euc./non-euc. combined)		**35**			5	**10**			10	**15**			10
Coarse woody debris (m/ha)		**384**			3	**314**			3	**151**			3
Non-native plant cover (%):		**0**			5	**0**			10	**0**			5
Quality/availability of food/foraging habitat (-/25)					20.0				20.0				20.0
Quality/availability of shelter (-/25)					20.0				20.0				20.0
Site condition score (-/130)					**90.5**				**107.5**				**107.5**
Size of patch (fragmented) (-/10)					10				10				10
Context (fragmented) (-/5)					5				5				5
Connectedness (fragmented) (-/5)					5				5				5
Species mobility capacity (-/25)					25				25				25
Threats to the species (-/25)					25				25				25
Site context score (-/70)					**70.0**				**70.0**				**70.0**
Assessment unit totals													
AU site condition score (-/3):					2.09				2.48				2.48
AU site context score (-/3):					3.00				3.00				3.00
AU species stocking rate (-/4):					2.29				2.29				0.00
AU habitat quality score (-/10):					**7.37**				**7.77**				**5.48**
AU area within offset area:					38.83				113.43				2.99
Total offset area for this MNES:					480.00				480.00				480.00
Area weighting:					0.08				0.24				0.01
AU weighted HQS:					**0.60**				**1.84**				**0.03**

Appendix C: Offset Assessment Guide outputs

Appendix C1: OAG output for brigalow TEC

Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 1999
2 October 2012

Matter of National Environmental Significance	
Name	Brigalow
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definition	1.2%

Impact calculator

Ecological communities

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Information source
Area of community	Yes	Brigalow	Area *(Hectares)*	7.6	
			Quality *(Scale 0-10)*	5	
		Total quantum of impact *(Adjusted Hectares)*		3.80	

Threatened species habitat

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Information source
Area of habitat	No		Area *(Hectares)*		
			Quality *(Scale 0-10)*		
		Total quantum of impact *(Adjusted Hectares)*			

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Information source
Number of features e.g. Nest hollows, habitat trees	No			
Condition of habitat Change in habitat condition, but no change in extent	No			

Threatened species

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Information source
Birth rate e.g. Change in nest success	No			
Mortality rate e.g Change in number of road kills per year	No			
Number of individuals e.g. Individual plants/animals	No			

Offset calculator

Ecological Communities

Protected matter attributes	Attribute relevant to case?	Total quantum of impact *(Adjusted Hectares)*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality *without* offset *(adjusted hectares)*		Future area and quality *with* offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted hectares)*	Offset Result		Cost *($ total)*	Information source
Area of community	Yes	3.80		Risk-related time horizon *(max. 20 years)*	20	Start area *(hectares)*	23	Risk of loss *without* offset *(%)*	8%	Risk of loss *with* offset *(%)*	0%	1.94	100%	1.94	1.53	Overall net present value	3.89		
				Time until ecological benefit	20	Start quality *(scale of 0-10)*	5	Future quality *without* offset *(scale of 0-10)*	5	Future quality *with* offset *(scale of 0-10)*	7	2.00	85%	1.70	1.34	% of impact offset	102.33%		
								Future area *without* offset	21.1	Future area *with* offset	23.0					Minimum (90%) direct offset requirement met?	TRUE		

Threatened species habitat

Protected matter attributes	Attribute relevant to case?	Total quantum of impact *(Adjusted Hectares)*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality *without* offset *(adjusted hectares)*		Future area and quality *with* offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted hectares)*	Offset Result		Cost *($ total)*	Information source
Area of habitat	Yes			Risk-related time horizon *(max. 20 years)*		Start area *(hectares)*		Risk of loss *without* offset *(%)*		Risk of loss *with* offset *(%)*		0.00		0.00	0.00	Overall net present value	0.00		
				Time until ecological benefit		Start quality *(scale of 0-10)*		Future quality *without* offset *(scale of 0-10)*		Future quality *with* offset *(scale of 0-10)*		0.00		0.00	0.00	% of impact offset	0.00%		
								Future area *without* offset	0.0	Future area *with* offset	0.0					Minimum (90%) direct offset requirement met?	FALSE		

Protected matter attributes	Attribute relevant to case?	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost *($ total)*	Information source
Number of features e.g. Nest hollows, habitat trees	No							0.00		0.00	0.00	0.00%	FALSE		
Condition of habitat Change in habitat condition, but no change in extent	No							0.00		0.00	0.00	0.00%	FALSE		

Threatened species

Protected matter attributes	Attribute relevant to case?	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost *($ total)*	Information source
Birth rate e.g. Change in nest success	No							0.00		0.00	0.00	0.00%	FALSE		
Mortality rate e.g Change in number of road kills per year	No							0.00		0.00	0.00	0.00%	FALSE		
Number of individuals e.g. Individual plants/animals	No							0.00		0.00	0.00	0.00%	FALSE		

Summary

					Cost ($)		
Protected matter attributes	Quantum of impact	Net present value	% of impact offset	Direct offset adequate?	Direct offset	Other compensatory measures	Total
Birth rate	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Mortality rate	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Number of individuals	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Number of features	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Condition of habitat	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Area of habitat		0.00	0.00	FALSE	0.00	N/A	0.00
Area of community	3.80	3.89	1.02	TRUE	0.00	N/A	0.00
					$0.00	**$0.00**	**$0.00**

Appendix C2: OAG output for poplar box TEC

Impact calculator

Ecological communities

Protected matter attributes	Attribute relevant to	Description	Quantum of impact		Information source
Area of commun	Yes	Brigalow	Area *(Hectares)*	44.4	
			Quality *(Scale 0-10)*	7	
		Total quantum of impact *(Adjusted Hectares)*		31.08	

Threatened species habitat

Protected matter attributes	Attribute relevant to	Description	Quantum of impact		Information source
Area of habitat	No		Area *(Hectares)*		
			Quality *(Scale 0-10)*		
		Total quantum of impact *(Adjusted Hectares)*			

Protected matter attributes	Attribute relevant to	Description	Quantum of impact	Information source
Number of features e.g. Nest hollows, habitat trees	No			
Condition of habitat Change in habitat condition, but no	No			

Threatened species

Protected matter attributes	Attribute relevant to	Description	Quantum of impact	Information source
Birth rate e.g. Change in nest success	No			
Mortality rate e.g Change in number of road kills per year	No			
Number of individuals e.g. Individual plants/animals	No			

Offset calculator

Ecological Communities

Protected matter attributes	Attribute relevant to	Total quantum of impact *(Adjusted*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality without offset *(adjusted hectares)*		Future area and quality with offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted*	Offset Result		Cost *($ total)*	Information source
Area of commun	Yes	31.08	AU2 RE 11.3.2 ha	Risk-related time horizon	20	Start area *(hectares)*	291.7	Risk of loss without offset	8%	Risk of loss with offset *(%)*	0%	24.56	100%	24.56	19.35	Overall net present value	47.04		
				Time until ecological benefit	20	Start quality *(scale of 0-10)*	7	Future quality without offset	6	Future quality with offset	8	2.00	75%	1.50	1.18	% of impact offset	151.37%		
								Future area without	267.1	Future area with offset	291.7			Minimum (90%) direct offset requirement met?			TRUE		

Threatened species habitat

Protected matter attributes	Attribute relevant to	Total quantum of impact *(Adjusted*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality without offset *(adjusted hectares)*		Future area and quality with offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted*	Offset Result		Cost *($ total)*	Information source
Area of habitat	Yes			Risk-related time horizon		Start area *(hectares)*		Risk of loss without offset		Risk of loss with offset *(%)*		0.00		0.00	0.00	Overall net present value	0.00		
				Time until ecological benefit		Start quality *(scale of 0-10)*		Future quality without offset		Future quality with offset		0.00		0.00	0.00	% of impact offset	0.00%		
								Future area without	0.0	Future area with offset	0.0			Minimum (90%) direct offset requirement met?			FALSE		

Protected matter attributes	Attribute relevant to	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement	Cost *($ total)*	Information source
Number of features e.g. Nest hollows, habitat trees	No							0.00		0.00	0.00	0.00%	FALSE		
Condition of habitat Change in habitat condition, but no	No							0.00		0.00	0.00	0.00%	FALSE		

Threatened species

Protected matter attributes	Attribute relevant to	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement	Cost *($ total)*	Information source
Birth rate e.g. Change in nest success	No							0.00		0.00	0.00	0.00%	FALSE		
Mortality rate e.g Change in number of road kills per year	No							0.00		0.00	0.00	0.00%	FALSE		
Number of individuals e.g. Individual plants/animals	No							0.00		0.00	0.00	0.00%	FALSE		

Appendix C3: OAG output for ornamental snake habitat

Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 19
2 October 2012

Matter of National Environmental Significance	
Name	Ornamental Snake
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Impact calculator

Ecological communities

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Information source
Area of community	Yes		Area *(Hectares)*		
			Quality *(Scale 0-10)*		
		Total quantum of impact *(Adjusted Hectares)*		0.00	

Threatened species habitat

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Information source
Area of habitat	Yes		Area *(Hectares)*	42	
			Quality *(Scale 0-10)*	4	
		Total quantum of impact *(Adjusted Hectares)*		16.80	

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Information source
Number of features e.g. Nest hollows, habitat trees	No			
Condition of habitat Change in habitat condition, but no change in extent	No			

Threatened species

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Information source
Birth rate e.g. Change in nest success	No			
Mortality rate e.g Change in number of road kills per year	No			
Number of individuals e.g. Individual plants/animals	No			

Offset calculator

Ecological Communities

Protected matter attributes	Attribute relevant to case?	Total quantum of impact *(Adjusted Hectares)*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality without offset *(adjusted hectares)*		Future area and quality with offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted hectares)*	Offset Result		Cost *($ total)*
Area of community	Yes	0.00		Risk-related time horizon *(max. 20 years)*		Start area *(hectares)*		Risk of loss without offset *(%)*		Risk of loss with offset *(%)*		0.00		0.00	0.00	Overall net present value	0.00	
				Time until ecological benefit		Start quality *(scale of 0-10)*		Future quality without offset *(scale of 0-10)*		Future quality with offset *(scale of 0-10)*		0.00		0.00	0.00	% of impact offset	0.00%	
								Future area without offset	0.0	Future area with offset	0.0			Minimum (90%) direct offset requirement met?			FALSE	

Threatened species habitat

Protected matter attributes	Attribute relevant to case?	Total quantum of impact *(Adjusted Hectares)*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality without offset *(adjusted hectares)*		Future area and quality with offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted hectares)*	Offset Result		Cost *($ total)*
Area of habitat	Yes	16.80		Risk-related time horizon *(max. 20 years)*	20	Start area *(hectares)*	92	Risk of loss without offset *(%)*	8%	Risk of loss with offset *(%)*	0%	7.36	100%	7.36	7.07	Overall net present value	17.15	
				Time until ecological benefit	20	Start quality *(scale of 0-10)*	5	Future quality without offset *(scale of 0-10)*	5	Future quality with offset *(scale of 0-10)*	7	2.00	75%	1.50	1.44	% of impact offset	102.08%	
								Future area without offset	84.6	Future area with offset	92.0			Minimum (90%) direct offset requirement met?			TRUE	

Protected matter attributes	Attribute relevant to case?	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost *($ total)*
Number of features e.g. Nest hollows, habitat trees	No							0.00		0.00	0.00	0.00%	FALSE	
Condition of habitat Change in habitat condition, but no change in extent	No							0.00		0.00	0.00	0.00%	FALSE	

Threatened species

Protected matter attributes	Attribute relevant to case?	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost *($ total)*
Birth rate e.g. Change in nest success	No							0.00		0.00	0.00	0.00%	FALSE	
Mortality rate e.g Change in number of road kills per year	No							0.00		0.00	0.00	0.00%	FALSE	
Number of individuals e.g. Individual plants/animals	No							0.00		0.00	0.00	0.00%	FALSE	

Summary

					Cost ($)		
Protected matter attributes	Quantum of impact	Net present value	% of impact offset	Direct offset adequate?	Direct offset	Other compensatory measures	Total
Birth rate	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Mortality rate	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Number of individuals	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Number of features	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Condition of habitat	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Area of habitat	16.80	17.15	1.02	TRUE	0.00	N/A	0.00
Area of community	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
					$0.00	**$0.00**	**$0.00**

Appendix C4: OAG output for greater glider habitat

Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 19
2 October 2012

Matter of National Environmental Significance	
Name	Greater Glider
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Impact calculator

Ecological communities

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Information source
Area of community	No		Area *(Hectares)*		
			Quality *(Scale 0-10)*		
		Total quantum of impact *(Adjusted Hectares)*			

Threatened species habitat

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Information source
Area of habitat	Yes		Area *(Hectares)*	93.6	
			Quality *(Scale 0-10)*	5	
		Total quantum of impact *(Adjusted Hectares)*		46.80	

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Information source
Number of features e.g. Nest hollows, habitat trees	No			
Condition of habitat Change in habitat condition, but no change in extent	No			

Threatened species

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Information source
Birth rate e.g. Change in nest success	No			
Mortality rate e.g Change in number of road kills per year	No			
Number of individuals e.g. Individual plants/animals	No			

Offset calculator

Ecological Communities

Protected matter attributes	Attribute relevant to case?	Total quantum of impact *(Adjusted Hectares)*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality without offset *(adjusted hectares)*		Future area and quality with offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted hectares)*	Offset Result		Cost *(5 total)*
Area of community	Yes			Risk-related time horizon *(max. 20 years)*		Start area *(hectares)*		Risk of loss without offset *(%)*		Risk of loss with offset *(%)*		0.00		0.00	0.00	Overall net present value	0.00	
				Time until ecological benefit		Start quality *(scale of 0-10)*		Future quality without offset *(scale of 0-10)*		Future quality with offset *(scale of 0-10)*		0.00		0.00	0.00	% of impact offset	0.00%	
								Future area without offset	0.0	Future area with offset	0.0			Minimum (90%) direct offset requirement met?			FALSE	

Threatened species habitat

Protected matter attributes	Attribute relevant to case?	Total quantum of impact *(Adjusted Hectares)*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality without offset *(adjusted hectares)*		Future area and quality with offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted hectares)*	Offset Result		Cost *(5 total)*
Area of habitat	Yes	46.80		Risk-related time horizon *(max. 20 years)*	20	Start area *(hectares)*	365	Risk of loss without offset *(%)*	8%	Risk of loss with offset *(%)*	0%	29.20	100%	29.20	28.06	Overall net present value	47.06	
				Time until ecological benefit	20	Start quality *(scale of 0-10)*	6	Future quality without offset *(scale of 0-10)*	6	Future quality with offset *(scale of 0-10)*	7	1.00	85%	0.85	0.82	% of impact offset	100.56%	
								Future area without offset	335.8	Future area with offset	365.0			Minimum (90%) direct offset requirement met?			TRUE	

Protected matter attributes	Attribute relevant to case?	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost *(5 total)*
Number of features e.g. Nest hollows, habitat trees	No							0.00		0.00	0.00	0.00%	FALSE	
Condition of habitat Change in habitat condition, but no change in extent	No							0.00		0.00	0.00	0.00%	FALSE	

Threatened species

Protected matter attributes	Attribute relevant to case?	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost *(5 total)*
Birth rate e.g. Change in nest success	No							0.00		0.00	0.00	0.00%	FALSE	
Mortality rate e.g Change in number of road kills per year	No							0.00		0.00	0.00	0.00%	FALSE	
Number of individuals e.g. Individual plants/animals	No							0.00		0.00	0.00	0.00%	FALSE	

Summary

					Cost ($)		
Protected matter attributes	Quantum of impact	Net present value	% of impact offset	Direct offset adequate?	Direct offset	Other compensatory measures	Total
Birth rate	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Mortality rate	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Number of individuals	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Number of features	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Condition of habitat	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Area of habitat	46.80	47.06	1.01	TRUE	0.00	N/A	0.00
Area of community		0.00	0.00	FALSE	0.00	N/A	0.00
					$0.00	**$0.00**	**$0.00**

Appendix C5: OAG output for koala habitat

Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 19
2 October 2012

Matter of National Environmental Significance	
Name	Koala
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Impact calculator

Ecological communities

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Information source
Area of community	No		Area *(Hectares)*		
			Quality *(Scale 0-10)*		
		Total quantum of impact *(Adjusted Hectares)*			

Threatened species habitat

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Information source
Area of habitat	Yes		Area *(Hectares)*	102	
			Quality *(Scale 0-10)*	6	
		Total quantum of impact *(Adjusted Hectares)*		61.20	

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Information source
Number of features e.g. Nest hollows, habitat trees	No			
Condition of habitat Change in habitat condition, but no change in extent	No			

Threatened species

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Information source
Birth rate e.g. Change in nest success	No			
Mortality rate e.g Change in number of road kills per year	No			
Number of individuals e.g. Individual plants/animals	No			

Offset calculator

Ecological Communities

Protected matter attributes	Attribute relevant to case?	Total quantum of impact *(Adjusted Hectares)*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality without offset *(adjusted hectares)*		Future area and quality with offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted hectares)*	Offset Result		Cost *($ total)*
Area of community	Yes			Risk-related time horizon *(max. 20 years)*		Start area *(hectares)*		Risk of loss without offset *(%)*		Risk of loss with offset *(%)*		0.00		0.00	0.00	Overall net present value	0.00	
				Time until ecological benefit		Start quality *(scale of 0-10)*		Future quality without offset *(scale of 0-10)*		Future quality with offset *(scale of 0-10)*		0.00		0.00	0.00	% of impact offset	0.00%	
								Future area without offset	0.0	Future area with offset	0.0			Minimum (90%) direct offset requirement met?			FALSE	

Threatened species habitat

Protected matter attributes	Attribute relevant to case?	Total quantum of impact *(Adjusted Hectares)*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality without offset *(adjusted hectares)*		Future area and quality with offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted hectares)*	Offset Result		Cost *($ total)*
Area of habitat	Yes	61.20		Risk-related time horizon *(max. 20 years)*	20	Start area *(hectares)*	480	Risk of loss without offset *(%)*	8%	Risk of loss with offset *(%)*	0%	38.40	100%	38.40	36.90	Overall net present value	61.89	
				Time until ecological benefit	20	Start quality *(scale of 0-10)*	6	Future quality without offset *(scale of 0-10)*	6	Future quality with offset *(scale of 0-10)*	7	1.00	85%	0.85	0.82	% of impact offset	101.13%	
								Future area without offset	441.6	Future area with offset	480.0			Minimum (90%) direct offset requirement met?			TRUE	

Protected matter attributes	Attribute relevant to case?	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost *($ total)*
Number of features e.g. Nest hollows, habitat trees	No							0.00		0.00	0.00	0.00%	FALSE	
Condition of habitat Change in habitat condition, but no change in extent	No							0.00		0.00	0.00	0.00%	FALSE	

Threatened species

Protected matter attributes	Attribute relevant to case?	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost *($ total)*
Birth rate e.g. Change in nest success	No							0.00		0.00	0.00	0.00%	FALSE	
Mortality rate e.g Change in number of road kills per year	No							0.00		0.00	0.00	0.00%	FALSE	
Number of individuals e.g. Individual plants/animals	No							0.00		0.00	0.00	0.00%	FALSE	

Summary

					Cost ($)		
Protected matter attributes	Quantum of impact	Net present value	% of impact offset	Direct offset adequate?	Direct offset	Other compensatory measures	Total
Birth rate	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Mortality rate	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Number of individuals	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Number of features	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Condition of habitat	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Area of habitat	61.20	61.89	1.01	TRUE	0.00	N/A	0.00
Area of community		0.00	0.00	FALSE	0.00	N/A	0.00
					$0.00	**$0.00**	**$0.00**

Attachment 1: Terrestrial ecology reports

Attachment 1A: Lake Vermont Meadowbrook Project - Terrestrial Ecology Assessment

AARC Environmental Solutions, April 2022

Please see file supplied separately