Biodiversity Development Assessment Report
Mine Camp Accommodation

Cobar LGA NSW
February 2020

AREA
ENVIRONMENTAL CONSULTANTS & COMMUNICATION

AREA Environmental Consultants & Communication
(a) 6 Belmore Street Dubbo NSW 2830
(b) "Thieles Gate" (Type 2 Conservation Agreement Area) 79 Huonbrook Rd Mullumbimby NSW 2482
Ph 0409 852 098
phil@areaenvironmental.com.au

ABN:29 616 529 867
Advanced Regional Environmental Assessments (AREA)

- ✓ Environmental impact assessment, approvals and auditing
- ✓ Preliminary environmental assessment (PEA)
- ✓ Review of environmental factors (REF)
- ✓ Peer review
- ✓ Community engagement
- ✓ Biobanking and biodiversity offsetting assessments
- ✓ Aboriginal heritage assessments and community walkovers
- ✓ Landscape planning and design

AREA Environmental Consultants & Communication acknowledge Traditional Owners of the country on which we work

Cover picture: Looking north, to the west of the existing development on Lot 991 DP1029946.

Executive Summary

AREA Environmental Consultants & Communication (AREA) was commissioned by Premise to assess the potential environmental impact associated with a proposed expansion of the Mine Workers Village in Cobar, NSW (the proposal).

This biodiversity and impact assessment will be presented in this Biodiversity Development Assessment Report (BDAR).

The proposed development is to be assessed under Part 4 of the *Environmental Planning and Assessment Act 1979*. This BDAR addresses requirements of the following legislative frameworks:

- *NSW Environmental Planning and Assessment Act 1979* (EP&A Act).
- *NSW Biodiversity Conservation Act 2016* (BC Act).
- *NSW Local Land Services Act 2013* (LLS Act).
- *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017* (Veg SEPP).

The purpose of this proposal is to increase the accommodation, parking and wastewater disposal capacity of the site. Scope of work includes:

- Installation of an additional 20 four-berth accommodation buildings;
- Installation of a 250,000 litre firefighting water tank;
- Minor extension of the car parking on site including a bus parking bay to provide additional spaces; and
- Installation of various effluent management areas as per the recommendations of the Envirowest report.

The installation of the effluent management areas would typically entail the following:

- minor trenching from existing effluent tanks to proposed site location to enable to the laying of the irrigation pipeline
- backfilling trench
- installing sprinkler system
- use of sprinkler system upon completion of installation.

.

Document Controls

Proponent			
Client	Premise		
Document Description	Biodiversity Development Assessment Report: Mine Workers Village expansion		
Clients Representative Managing this Document	AREA Person(s) Managing this Document		
David Walker	Phil Cameron (PJC) - Principal Consultant		
Location	AREA Job No. QU-0157		
\Clients\Premise\Orange\MineCamp			
Document Status: **DRAFT**	Version	Date	Action
Series V1.X = Internal edits	V1.0 V1.1	17.10.19 18.10.19	PJC report completed Reviewed
Series V2.X = Client internal edits	V2.0 V2.1	18.10.19 28.10.19	Delivered to client Minor edits addressed
FINAL when draft is approved by client	V3.0 V3.1	5.11.19 5.02.20	Finalised Reissue (minor update)
Prepared For	Prepared by		
DAVID WALKER Senior Town Planner T 02 6393 5000 | M 0437 621 057 E David.Walker@premise.com.au A 154 Peisley St, Orange NSW 2800	Phil Cameron - Principal Consultant AREA Environmental Consultants & Communication Pty Ltd 6 Belmore Street Dubbo NSW 2830 M 0409 852 098 E phil@areaenvironmental.com.au ABN:29 616 529 867		

TABLE OF CONTENTS

FIGURES

TABLES

BAM definitions and acronyms used in this document

Definitions

Accredited person: has the same meaning as in the BC Act, referred to in the BAM as 'assessor'.
Ancillary rules: has the same meaning as set out in clause 6.5 of the BC Regulation.
Annual probability of decline in vegetation and habitat condition: an estimate of the average probability of decline of each attribute through clearing, stochastic factors or ongoing degrading actions (firewood removal, weed invasion, livestock grazing).
Areas of geological significance: geological features such as karst, caves, crevices, cliffs.
Assessment area surrounding the subject land: the area of land in the 1500m buffer zone around a development site, or land to be biodiversity certified or a biodiversity stewardship site, that is determined in accordance with Subsection 4.3.2.
Assessor: the person accredited under the BC Act referred to in Subsection 2.1.2 and who has been engaged by the proponent.
Averted loss: the gain in vegetation and habitat condition that arises from managing the proposed land as an offset compared to the probable future vegetation condition if the land was to be left unmanaged (see *Annual probability of decline*).
Avoid: measures taken by a proponent such as careful site selection or actions taken through the design, planning, construction and operational phases of the development to completely avoid impacts on biodiversity values, or certain areas of biodiversity. Refer to the BAM for operational guidance.
BAM: the Biodiversity Assessment Method.
BC Act: the Biodiversity Conservation Act 2016.
BC Regulation: the Biodiversity Conservation Regulation 2017.
Benchmark data: for a PCT, vegetation class or vegetation formation benchmark data is contained in the BioNet Vegetation Classification. A local reference site may also be used to establish benchmark data for a PCT that may be used in a BAM assessment.
Benchmarks: the quantitative measures that represent the 'best-attainable' condition, which acknowledges that native vegetation within the contemporary landscape has been subject to both natural and human-induced disturbance. Benchmarks are defined for specified variables for each PCT. Vegetation with relatively little evidence of modification generally has minimal timber harvesting (few stumps, coppicing, cut logs), minimal firewood collection, minimal exotic weed cover, minimal grazing and trampling by introduced or overabundant native herbivores, minimal soil disturbance, minimal canopy dieback, no evidence of recent fire or flood, is not subject to high frequency burning, and has evidence of recruitment of native species.
Biodiversity certification: has the same meaning as in the BC Act.
Biodiversity Certification Assessment Report (BCAR): has the same meaning as in the BC Act.
Biodiversity credit report: the report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site.
Biodiversity Development Assessment Report (BDAR): has the same meaning as in the BC Act.
Biodiversity offsets: management actions that are undertaken to achieve a gain in biodiversity values on areas of land in order to compensate for losses to biodiversity values from the impacts of development.
Biodiversity Stewardship Agreement: has the same meaning as in the BC Act.
Biodiversity Stewardship Assessment Report (BSAR): the report that must be prepared in accordance with the BAM and submitted as part of an application for a biodiversity stewardship agreement.
Biodiversity values: has the same meaning as clause 1.5(2) of the BC Act.

Biodiversity values map: is established according to clause 7.3 of the BC Regulation. Development within an area identified on the map requires assessment using the BAM.
BioNet Atlas: the OEH database of flora and fauna records (formerly known as the NSW Wildlife Atlas). The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails listed under the BC Act) and some fish.
BioNet Vegetation Classification: the master vegetation community-level classification for use in vegetation mapping programs and regulatory biodiversity impact assessment frameworks in NSW. The BioNet Vegetation Classification is published by OEH and available at www.environment.nsw.gov.au/research/Visclassification.htm.
Broad condition state: areas of the same PCT that are in relatively homogenous condition. Broad condition is used for stratifying areas of the same PCT into a vegetation zone for the purpose of determining the vegetation integrity score.
Certified more appropriate local data: has the same meaning as set out in Subsection 2.2.2.
Change in vegetation integrity score for a biodiversity stewardship site: the difference (gain) between the estimated vegetation integrity score without management at a biodiversity stewardship site and the predicted future vegetation integrity score with management at a biodiversity stewardship site, calculated in accordance with Equation 28.
Class of biodiversity credit: as defined in Section 11.3.
Clearing site: the site proposed to be cleared of native vegetation where approval is sought under Part 5A of the *Local Land Services Act 2013* or the *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017*.
Clonal species: flora species that propagate asexually at a site or have a limited degree of sexual reproduction, either within or between sites. Modes of asexual reproduction will include vegetative reproduction such as by rhizomes, root suckers or bulb replication.
Connectivity: the measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.
Credit Calculator: the computer program that provides decision support to assessors and proponents by applying the BAM, in particular by using the data required to be entered and the equations in Appendix 6 and Appendix 9 to calculate the number and class of biodiversity credits required to offset the impacts of a development or created at a biodiversity stewardship site.
Critically endangered ecological community (CEEC): an ecological community specified as critically endangered in Schedule 2 of the BC Act and/or listed under Part 13, Division 1, Subdivision A of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).
Crown cover: the vertical projection of the periphery of tree crowns within a designated area.
Derived vegetation: PCTs that have changed to an alternative stable state as a consequence of land management practices since European settlement. Derived communities can have one or more structural components of the vegetation entirely removed or severely reduced (e.g. over-storey of grassy woodland) or have developed new structural components where they were previously absent (e.g. shrubby mid-storey in an open woodland system).
Development footprint: the area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials. The term *development footprint* is also taken to include clearing footprint except where the reference is to a small area development or a major project development.
Development site: an area of land that is subject to a proposed development that is under the EP&A Act. The term *development site* is also taken to include clearing site except where the reference is to a small area development or a major project development.
Ecosystem credits: a measurement of the value of threatened ecological communities, threatened species habitat for species that can be reliably predicted to occur with a PCT, and PCTs generally. Ecosystem credits measure the loss in biodiversity values at a development site and the gain in biodiversity values at a biodiversity stewardship site.

Endangered ecological community (EEC): an ecological community specified as endangered in Schedule 2 of the BC Act, or listed under the EPBC Act.
Environment Agency Head: has the same meaning as in the BC Act.
EP&A Act: the NSW Environmental Planning and Assessment Act 1979.
EPBC Act: the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.
Ephemeral flora species: flora species where the abundance of the species above ground fluctuates in response to the plant life history in combination with environmental conditions and/or disturbance regimes. Fluctuations in abundance may be short-term (seasonal) or long-term (yearly to decadal). Many ephemeral species persist underground through unfavourable conditions via soil seed banks or dormant vegetative organs (bulbs, tubers, rootstocks).
Estuarine area: a semi-enclosed body of water having an open or intermittently open connection with the ocean, in which water levels do not vary with the ocean tide (when closed to the sea) or vary in a predictable, periodic way in response to the ocean tide at the entrance (when open to the sea).
Expert: a person who has the relevant experience and/or qualifications to provide expert opinion in relation to the biodiversity values to which an expert report relates.
Foliage cover: the percentage of a plot area that would be covered by a vertical projection of the foliage and branches and trunk of a plant, or plants or a growth form group. Foliage cover can also be referred to as percent foliage cover.
Gain: the gain in biodiversity values at a biodiversity stewardship site, over time from undertaking management actions at a biodiversity stewardship site. Gain in biodiversity values is the basis for creating biodiversity credits at the biodiversity stewardship site.
Grassland: native vegetation classified in the vegetation formation 'Grasslands' in Keith (2004)[2]. Grasslands are generally dominated by large perennial tussock grasses, lack of woody plants, the presence of broad-leaved herbs in inter-tussock spaces, and their ecological association with fertile, heavy clay soils on flat topography in regions with low to moderate rainfall.
Growth form: the form that is characteristic of a particular flora species at maturity. Growth forms are set out in Appendix 4.
Habitat: an area or areas occupied, or periodically or occasionally occupied, by a species or ecological community, including any biotic or abiotic component.
Habitat component: the component of habitat that is used by a threatened species for either breeding, foraging or shelter.
Habitat surrogates: measures of habitat that predict the occurrence of threatened species and communities: IBRA subregion, PCT, percent vegetation cover and vegetation condition.
Herbfield: native vegetation which predominantly does not contain an over-storey or mid-storey and where the ground cover is dominated by non-grass species.
High threat exotic plant cover: plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species. Also referred to as high threat weeds.
Hollow bearing tree: a living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the entrance width is at least 5cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1m above the ground. Trees must be examined from all angles.
IBRA region: a bioregion identified under the Interim Biogeographic Regionalisation for Australia (IBRA) system[3], which divides Australia into bioregions on the basis of their dominant landscape-scale attributes.
IBRA subregion: a subregion of a bioregion identified under the IBRA system.
Impact assessment: an assessment of the impact or likely impact of a development on biodiversity values which is prepared in accordance with the BAM.
Impacts on biodiversity values: loss in biodiversity values from direct or indirect impacts of development in accordance with Chapters 8, 1 and 10.
Important wetland means:

(a) a wetland that is listed in the Directory of Important Wetlands of Australia (DIWA) from time to time, and
(b) for the purposes of all paragraphs except 4.2.1.6 the actual location on the ground that corresponds to a SEPP 14 Coastal wetland
(c) for the purposes of Paragraph 4.2.1.6:
(i) a SEPP 14 Coastal Wetland, and
(ii) the actual location on the ground that corresponds to a SEPP 14 Coastal Wetland.

Individual: in relation to organisms, a single, mature organism that is a threatened species, or any additional threatened species listed under Part 13 of the EPBC Act.

Intact vegetation: vegetation where all tree, shrub, grass and/or forb structural growth form groups expected for a plant community type are present.

Intrinsic rate of increase (*ir*): an estimate of the rate of gain for an attribute at a biodiversity stewardship site from actions undertaken as part of the management plan. The intrinsic rate of increase is specified for an attribute according to the formation of the PCT being assessed (see Appendix 8).

Landscape attributes: in relation to a development site or a biodiversity stewardship site, native vegetation cover, vegetation connectivity, patch size and the strategic location of a biodiversity stewardship site.

Large tree benchmark: is the largest stem size class for a PCT as determined by the benchmark for the PCT.

Life cycle: the series of stages of reproduction, growth, development, aging and death of an organism.

Life form: the form that is characteristic of a particular species at maturity. In the BAM, life form has the same meaning as growth form for flora species.

Linear shaped development: development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length.

Litter cover: the percentage ground cover of all plant material that has detached from a living plant, including leaves, seeds, twigs, branchlets and branches (<10cm in diameter).

Local population: the population that occurs in the study area. In cases where multiple populations occur in the development site or a population occupies part of the development site, impacts on each subpopulation must be assessed separately.

Local wetland: any wetland that is not identified as an important wetland (refer to definition of *Important wetland*).

Loss of biodiversity: the loss of biodiversity values from a development site, native vegetation clearing site or land where biodiversity certification is conferred.

Major project: State Significant Development and State Significant Infrastructure.

Minimise: a process applied throughout the development planning and design life cycle which seeks to reduce the residual impacts of development on biodiversity values.

Mitchell landscape: landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.

Multiple fragmentation impact development: developments such as wind farms and coal seam gas extraction that require multiple extraction points (wells) or turbines and a network of associated development including roads, tracks, gathering systems/flow lines, transmission lines.

Native ground cover: all native vegetation below 1m in height, including all such species native to NSW (i.e. not confined to species indigenous to the area).

Native ground cover (grasses): native ground cover composed specifically of native grasses.

Native ground cover (other): native ground cover composed specifically of non-woody native vegetation (vascular plants only) <1m in height that is not grass (e.g. herbs, ferns).

Native ground cover (shrubs): native ground cover composed specifically of native woody vegetation <1m in height.

Native mid-storey cover: all vegetation between the over-storey stratum and a height of 1m (typically tall shrubs, under-storey trees and tree regeneration) and including all species native to NSW (i.e. native species not local to the area can contribute to mid-storey structure).

Native over-storey cover: the tallest woody stratum present (including emergent) above 1m and including all species native to NSW (i.e. native species not local to the area can contribute to over-storey structure). In a woodland community, the over-storey stratum is the tree layer, and in a shrubland community the over-storey stratum is the tallest shrub layer. Some vegetation types (e.g. grasslands) may not have an over-storey stratum.
Native plant species richness: the number of different native vascular plant species that are characteristic of a PCT.
Native vegetation: has the same meaning as in section 1.6 of the BC Act.
Native vegetation cover: the percentage of native vegetation cover on the subject land and the surrounding buffer area. Cover estimates are based on the cover of native woody and non-woody vegetation relative to the approximate benchmarks for the PCT, taking into account vegetation condition and extent. Native over-storey vegetation is used to determine the percent cover in woody vegetation types, and native ground cover is used to assess cover in non-woody vegetation types.
Number of trees with hollows: a count of the number of living and dead trees that are hollow bearing.
Offset rules: are those established by the BC Regulation.
Onsite measures: measures and strategies that are taken or are proposed to be taken at a development site to avoid and minimise the direct and indirect impacts of the development on biodiversity values.
Operational Manual: the Operational Manual published from time to time by OEH, which is a guide to assist assessors when using the BAM.
Patch size: an area of intact native vegetation that:
a) occurs on the development site or biodiversity stewardship site, and
b) includes native vegetation that has a gap of less than 100m from the next area of moderate to good condition native vegetation (or ≤30m for non-woody ecosystems).
Patch size may extend onto adjoining land that is not part of the development site or biodiversity stewardship site.
PCT classification system: the system of classifying native vegetation approved by the NSW Plant Community Type Control Panel and described in the BioNet Vegetation Classification.
Percent cleared value: the percentage of a PCT that has been cleared as a proportion of its pre-1750 extent, as identified in the BioNet Vegetation Classification.
Plant community type (PCT): a NSW plant community type identified using the PCT classification system.
Plot: an area within a vegetation zone in which site attributes are assessed.
Population: a group of organisms, all of the same species, occupying a particular area.
Probability of reaching benchmark: the probability of a specific attribute or growth form group reaching benchmark conditions in the vegetation zone at the end of the management timeframe.
Proponent: a person who intends to apply for consent or approval to carry out development, clearing, biodiversity certification or for approval for infrastructure.
Reference sites: the relatively unmodified sites that are assessed to obtain local benchmark information when benchmarks in the Vegetation Benchmarks Database are too broad or otherwise incorrect for the PCT and/or local situation. Benchmarks can also be obtained from published sources.
Regeneration: the proportion of over-storey species characteristic of the PCT that are naturally regenerating and have a diameter at breast height <5cm within a vegetation zone.
Residual impact: an impact on biodiversity values after all reasonable measures have been taken to avoid and minimise the impacts of development. Under the BAM, an offset requirement is calculated for the remaining impacts on biodiversity values.
Retirement of credits: the retirement of biodiversity credits from a biobank site or a biodiversity stewardship site secured by a biodiversity stewardship agreement.
Riparian buffer: an area of land determined according to Appendix 3.

Risk of extinction: the likelihood that the local population or CEEC or EEC will become extinct either in the short term or in the long term as a result of direct or indirect impacts on the viability of that population or CEEC or EEC.
SEPP 14 Coastal wetland: a wetland to which *State Environmental Planning Policy No 14 – Coastal Wetlands* applies or an area that is identified as a coastal wetland within the meaning of the term *coastal wetlands and littoral rainforests area* for the purposes of *Coastal Management Act 2016*.
Site attributes: the matters assessed to determine vegetation integrity. They include: native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.
Site-based development: a development other than a linear shaped development, or a multiple fragmentation impact development.
Site context: the value given to landscape attributes of a development site or biodiversity stewardship site after an assessment undertaken in accordance with Section 4.3.
Species credit species: are threatened species or components of species habitat that are identified in the Threatened Species Data Collection as requiring assessment for species credits.
Species credits: the class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
State Significant Development: has the meaning given by Division 4.1 of Part 4 of the EP&A Act.
State Significant Infrastructure: has the meaning given by Part 5.1 of the EP&A Act.
Stream order: has the same meaning as in Appendix 3.
Subject land: is land to which the BAM is applied in Stage 1 to assess the biodiversity values of the land. It includes land that may be a development site, clearing site, proposed for biodiversity certification or land that is proposed for a biodiversity stewardship agreement.
Threat status class: the extent to which a species or ecological community is threatened with extinction, or the extent to which a PCT is estimated to have been cleared (see *Percent cleared value*).
Threatened Biodiversity Data Collection: part of the BioNet database, published by OEH and accessible from the BioNet website at www.bionet.nsw.gov.au.
Threatened ecological community (TEC): means a critically endangered ecological community, an endangered ecological community or a vulnerable ecological community listed in Schedule 2 of the BC Act.
Threatened species: critically endangered, endangered or vulnerable threatened species as defined by Schedule 1 of the BC Act, or any additional threatened species listed under Part 13 of the EPBC Act as critically endangered, endangered or vulnerable.
Threatened species survey: a targeted survey for threatened species undertaken in accordance with Section 6.5.
Threatened species survey guidelines: survey methods or guidelines published by OEH from time to time at www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/about-threatened-species/surveys-and-assessments.
Total length of fallen logs: the total length of logs present in a vegetation zone that are at least 10cm in diameter and at least 0.5m long.
Transect: a line or narrow belt along which environmental data is collected.
Upland Swamp Policy: the document entitled *Addendum to NSW Biodiversity Offsets Policy for Major Projects: Upland swamps impacted by longwall mining subsidence* as in force on the day when the BAM is published until such time as the Environment Agency Head publishes any further document for the purpose of it being adopted by the BAM as the Upland Swamp Policy.

Vegetation Benchmarks Database: a database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by OEH and is part of the BioNet Vegetation Classification. It is available at www.environment.nsw.gov.au/research/Visclassification.htm.
Vegetation class: a level of classification of vegetation communities defined in Keith (2004)[4]. There are 99 vegetation classes in NSW.
Vegetation formation: a broad level of vegetation classification as defined in Keith (2004)[4]. There are 16 vegetation formations and sub-formations in NSW.
Vegetation integrity: the condition of native vegetation assessed for each vegetation zone against the benchmark for the PCT.
Vegetation integrity score: the quantitative measure of vegetation condition calculated in accordance with Equation 15 or Equation 16.
Vegetation zone: a relatively homogenous area of native vegetation on a development site, land to be biodiversity certified or a biodiversity stewardship site that is the same PCT and broad condition state.
Viability: the capacity of a species to successfully complete each stage of its life cycle under normal conditions so as to retain long-term population densities.
Vulnerable ecological community (VEC): an ecological community specified as vulnerable in Schedule 2 of the BC Act and/or listed under Part 13, Division 1, Subdivision A of the EPBC Act.
Wetland: an area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle. Wetlands may exhibit wet and dry phases and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water (see also *Important wetland* and *Local wetland*).
Woody native vegetation: native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs.

Acronyms

Acronym	Definition
BAR	Biodiversity Assessment Report
BAMC	Biodiversity Assessment Method Calculator
BASSR	Biodiversity Steward Site Assessment Report
BBAMC	BioBanking Credit Calculator
BOM	Bureau of Meteorology
BC Act	Biodiversity Conservation Act 2016
BOS	Biodiversity Offset Strategy
BVT	Biometric Vegetation Types
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environment Management Plan
CMA	Catchment Management Authority
DEC	Department of Environment and Conservation
DECC	Department of Environment and Climate Change
DECCW	Department of Environment, Climate Change and Water
DEE	Department of Environment and Energy formerly the Department of the Environment
DEWHA	Department of Environment, Water, Heritage and the Arts
DPE	Department of Planning and the Environment
DPI	Department of Primary industries
DotE	Department of the Environment
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EPBC	Environment Protection and Biodiversity Conservation Act 1999
FBA	Framework of Biodiversity Assessment
GDE	Groundwater dependent ecosystems
GIS	Geographic information system
GPS	Global positioning system
IBRA	Interim Biogeographic Regionalisation for Australia
KTP	Key threatening process
LEP	Local Environmental Plan
LGA	Local Government Area
MNES	Matters of National Environmental Significance
NP&W Act	National Parks and Wildlife Act 1974
NPWS	National Parks and Wildlife Services
NSW	New South Wales
OEH	Office of Environment and Heritage
PCT	Plant Community Types
PMST	Protected Matters Search Tool
Proposal	Highview Country Estate Dubbo Regional LGA
SAT	Scat Assessment Technique
SEARS	Secretary's Environmental Assessment Requirement
SEPP	State Environmental Planning Policy
SIS	Species Impact Statement
SSD	State Significant Development
TAFE	Technical and Further Education Institute
TEC	Threatened Ecological Community
TSPD	Threatened Species Profile Database
VEC	Vulnerable Ecological Community
VIS	Vegetation Information System
WIRES	Wildlife Information, Rescue and Education Services

1 Introduction to the proposal and the assessment team

1.1 Proposal description

AREA Environmental Consultants & Communication (AREA) was commissioned by Premise to complete a Biodiversity Development Assessment Report in relation to the proposed expansion of the Cobar Mine Workers Village, located at Lot 991 DP1029946, Barrier Highway, Cobar, NSW (Figure 1-1). The village incorporates an existing amenity building for the servicing of meals and for recreation as well as accommodation for 119 workers. Premise is currently preparing a development application to expand the village to provide an additional 80 beds of accommodation together with minor changes to the amenities building, provision of an onsite fire water storage tank, bus parking bay and the provision of additional / expanded on-site effluent management systems. About 3.15 hectares of native vegetation will be affected by the proposal.

The proposed effluent management systems have been sized via an On-Site Management Study completed by Envirowest Consulting Pty Ltd.

Scope of work includes:

- Installation of an additional 20 four berth accommodation buildings
- Installation of a 250,000 litre firefighting water tank
- Minor extension of the car parking on site including a bus parking bay to provide additional spaces (Figure 2-5)
- Implementation of a 50 metre buffer around proposed accommodation
- Installation of various effluent management areas as per the recommendations of the Envirowest report (Figure 2-5).

The installation of the effluent management areas would typically entail the following:

- minor trenching from existing effluent tanks (Figure 2-5) to proposed site location to enable to the laying of the irrigation pipeline
- backfilling trench
- installing sprinkler system
- use of sprinkler system upon completion of installation.

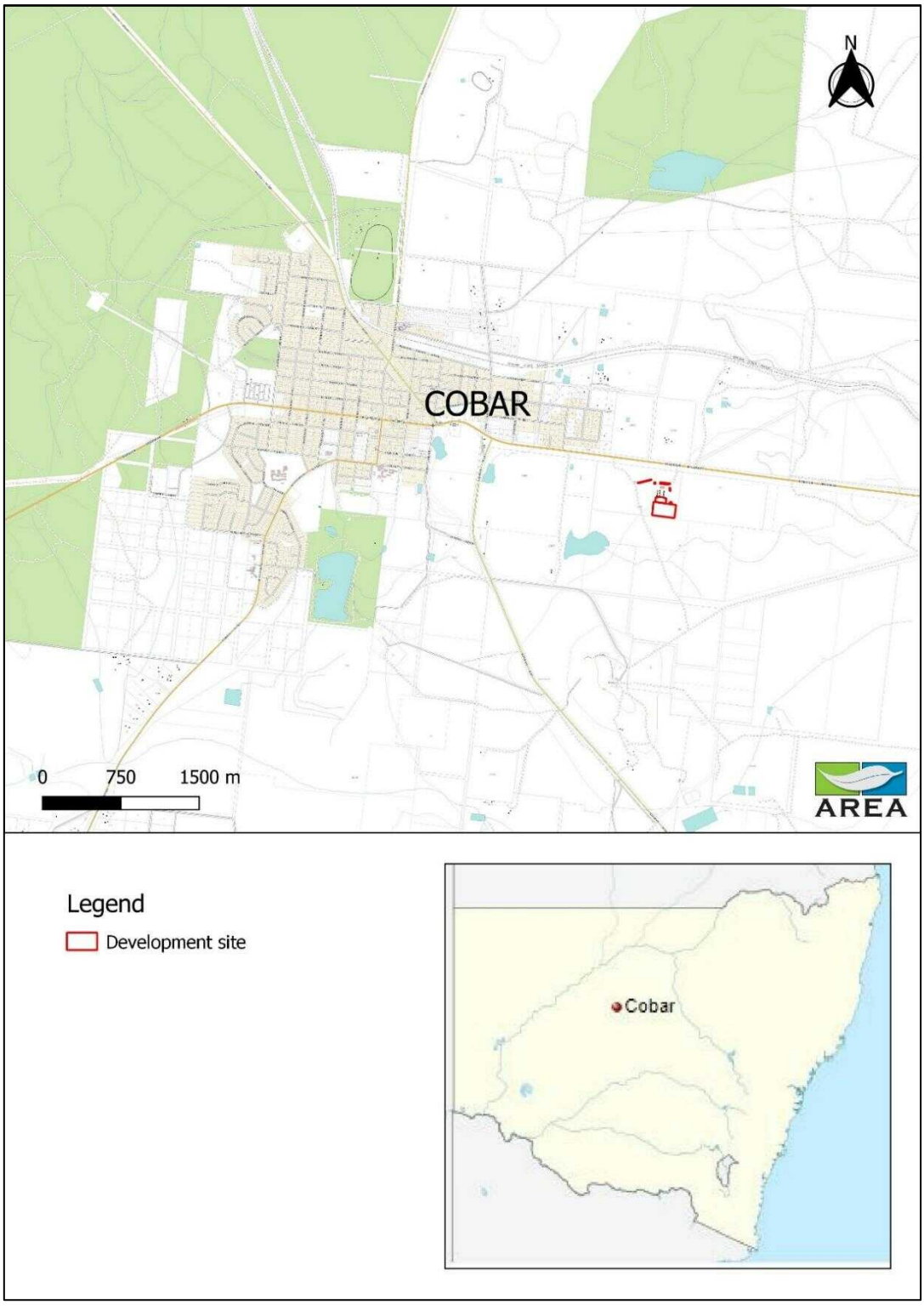
This assessment considers the impact to be removal of all native vegetation in the development site.

The proposed expansion is to be assessed under Part 4 of the *Environmental Planning and Assessment Act 1979*.

This BDAR addresses the environmental assessment requirements of the following legislative frameworks:

- *NSW Environmental Planning and Assessment Act 1979* (EP&A Act)
- *NSW Biodiversity Conservation Act 2016* (BC Act)
- *NSW Local Land Services Act 2013* (LLS Act)
- State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 (Veg SEPP).

Figure 1-1: Location of the development site



1.2 Report structure

This BDAR documents Stage 1 (assessing biodiversity values) and Stage 2 (Impact assessment to biodiversity values) of the Biodiversity Assessment Method (2017), hereafter 'BAM'.

This BDAR supports a Development Application under Division 4.1, Part 4 of the EP&A Act.

The structure of the report is summarised in Table 1-1.

Table 1-1: Report structure

Section reference	Section heading / BAM requirement	Description
Executive summary	Executive summary	Concise summary of this technical paper and the key findings
viii and ix	Definitions and acronyms	Provides definitions and summarises the acronyms used throughout this report.
1	Introduction to the proposal and the assessment team • Background • Report structure • Project personnel	Description of the proposal. Provides an overview of the assessment objectives, structure of technical report and staff contributing to this document.
Stage 1 BAM document (assessing biodiversity values)		
2	Introduction to the biodiversity assessment • identification of development footprint, including: ○ operation ○ construction indicating clearing associated with temporary construction facilities and infrastructure • general description of development/proposal • sources of information used in the assessment, including reports and spatial data.	Description of the proposal relevant to assessing biodiversity values in the development site. Provides an overview of the assessment objectives and structure of technical report.
3	Landscape features • IBRA bioregions and subregions, NSW landscape region and area (hectares) • native vegetation extent in the buffer area • cleared areas • evidence to support differences between mapped vegetation extent and aerial imagery • rivers and streams classified according to stream order • wetlands within, adjacent to and downstream of the site • connectivity features • areas of geological significance and soil hazard features ○ site context components, including: ○ identification of method applied (i.e. linear or site-based) ○ percent native vegetation cover in the landscape (development site).	Identifies landscape features at the development site footprint.
4	Native vegetation Describes PCTs within the development site, including: • vegetation class • vegetation type • area (hectares) for each vegetation type • species relied upon for identification of vegetation type and relative abundance	Identifies native vegetation extent within the development site, including cleared areas and evidence to support differences between mapped

Section reference	Section heading / BAM requirement	Description
	• justification of evidence used to identify a PCT (as outlined in Paragraph 5.2.1.12 of the BAM) • TEC status (as outlined in Paragraphs 5.2.1.14–5.2.1.15 of the BAM) • estimate of percent cleared value of PCT (as outlined in Paragraph) Vegetation integrity assessment of the development site, including: • mapping vegetation zones (Subsection 5.3.1 of the BAM) • patch size (development site and proposal) • assessing vegetation integrity using benchmark data (Subsection) • survey effort as described in Subsection 5.3.4 (number of plots) • determining the vegetation integrity score (Appendix 6 of the BAM): o composition condition score o structure condition score o function condition score o vegetation integrity score. Where use of local data is proposed: • identify relevant vegetation type • identify source of information for local benchmark data • justify use of local data in preference to database values.	vegetation extent and aerial imagery.
5	Threatened species Identify ecosystem credit species associated with PCTs in the development site as outlined in Section 6.2, including: • list of species derived • justification for exclusion of any ecosystem credit species predicted above. Identify species credit species on both the development site and the proposal as outlined in Sections 6.3 to 6.5, including: • list of candidate species • justification for inclusions and exclusions based on habitat features • indication of presence based on targeted survey or expert report • details of targeted survey technique, effort, timing and weather • species polygons • biodiversity risk weighting for the species • threatened species survey • additional requirements for wind farm developments. Where use of local data is proposed: • identify relevant species • identify aspect of species data • identify source of information for local data • justify use of local data in preference to database values. Where expert reports are used in place of targeted survey: • identify the relevant species • justify the use of an expert report • indicate and justify the likelihood of presence of the species and information considered in making this assessment • estimate the number of individuals or area of habitat (whichever unit of measurement applies to the species/individual) for the development site or proposal, including a description of how the estimate was made • identify the expert and provide evidence of their expert credentials.	Identifies the list of species and habitat components and their sensitivity classes and risk to development
Stage 2 BAM document - Impact assessment (biodiversity values)		
6	Matters of National Environmental Significance	Provides information of MNES species, populations or communities with potential to be recorded in the proposal.
7	Minimise impacts and nature of impact • Demonstration of efforts to avoid and minimise impact on biodiversity values in accordance with Chapter 8 of BAM (2017). • Assessment of direct and indirect impacts unable to be avoided at the development site in accordance with Sections 9.1 and 9.2 of	Provides information on minimising harm to the environment in the proposal

Section reference	Section heading / BAM requirement	Description
	BAM (2017). The assessment would include but not be limited to: type, frequency, intensity, duration and consequence of impact. • For major projects: details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (Section 9.4 of BAM (2017). • Identification and an assessment of the impacts which are potential serious and irreversible impacts, in accordance with Subsections 10.2.2 for impacts on CEECs and 10.2.3 for threatened species. • Identification of impacts requiring offset in accordance with Section 10.3. Identification of impacts not requiring offset in accordance with Paragraph 10.3.2.2. • Identification of areas not requiring assessment in accordance with Section 10.4.	Provides information on residual harm to the environment in the proposal
8	Mitigation measures	Provides actions to minimise harm to the environment
9	Biodiversity offsets	Identifies if biodiversity offsets have been triggered
10	Conclusions and recommendations • Conclusions • Recommendations	Concise statement of key findings of biodiversity values in the proposal.
11	References	Information sources used

1.3 Project personnel

This assessment was carried out by appropriately qualified and experienced ecologists (refer to Table 1-2).

Table 1-2: Summary of AREA project teams' qualifications

Name	Position	CV Details	Role in this project
Phillip Cameron	Principal Consultant	• BSc. Major in Biology. Macquarie University • Ass Dip App Sci. University of Queensland • Certified Environmental Practitioner (EIANZ) and practicing member • NSW OEH BioBanking and Bio-certification Assessor: accreditation number 0117 • NSW OEH Biodiversity Assessment Method Assessor: accreditation number BAAS17082 • NSW OEH Scientific License: 101087 • NSW DPI Ethics Approval 17/459 (3) • Practicing member of the NSW Ecological Consulting Association	Certification. Fieldwork Project Management. Report writing
Dave Sturman	Environmental Consultant	• B. Env. Sc. Charles Sturt University • Cert. III Horticulture TAFE • White card – general construction induction card. • RMS-worker on foot training. • Senior First Aid • Chainsaw operator ticket • Confined Space worker and atmospheric monitoring. • Risk assessment training.	Field work

STAGE 1 BAM: BIODIVERSITY ASSESSMENT

2 Introduction to the biodiversity assessment

2.1 Identification of proposal footprint

The proposal affects 3.15 hectares of land of Lot 991 DP1029946, Barrier Highway, Cobar, NSW (Figure 2-1).

Figure 2-1: Development site aerial

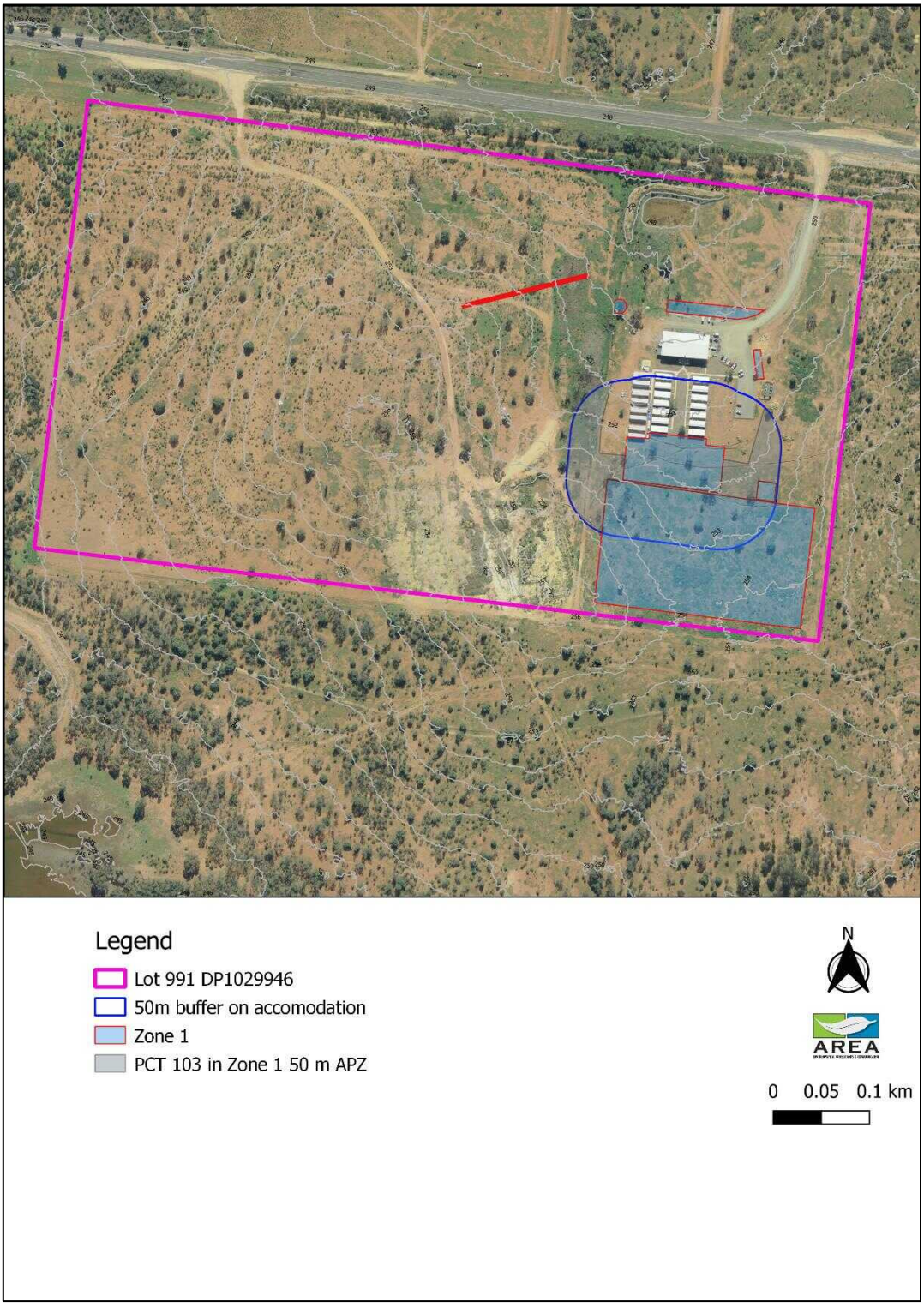
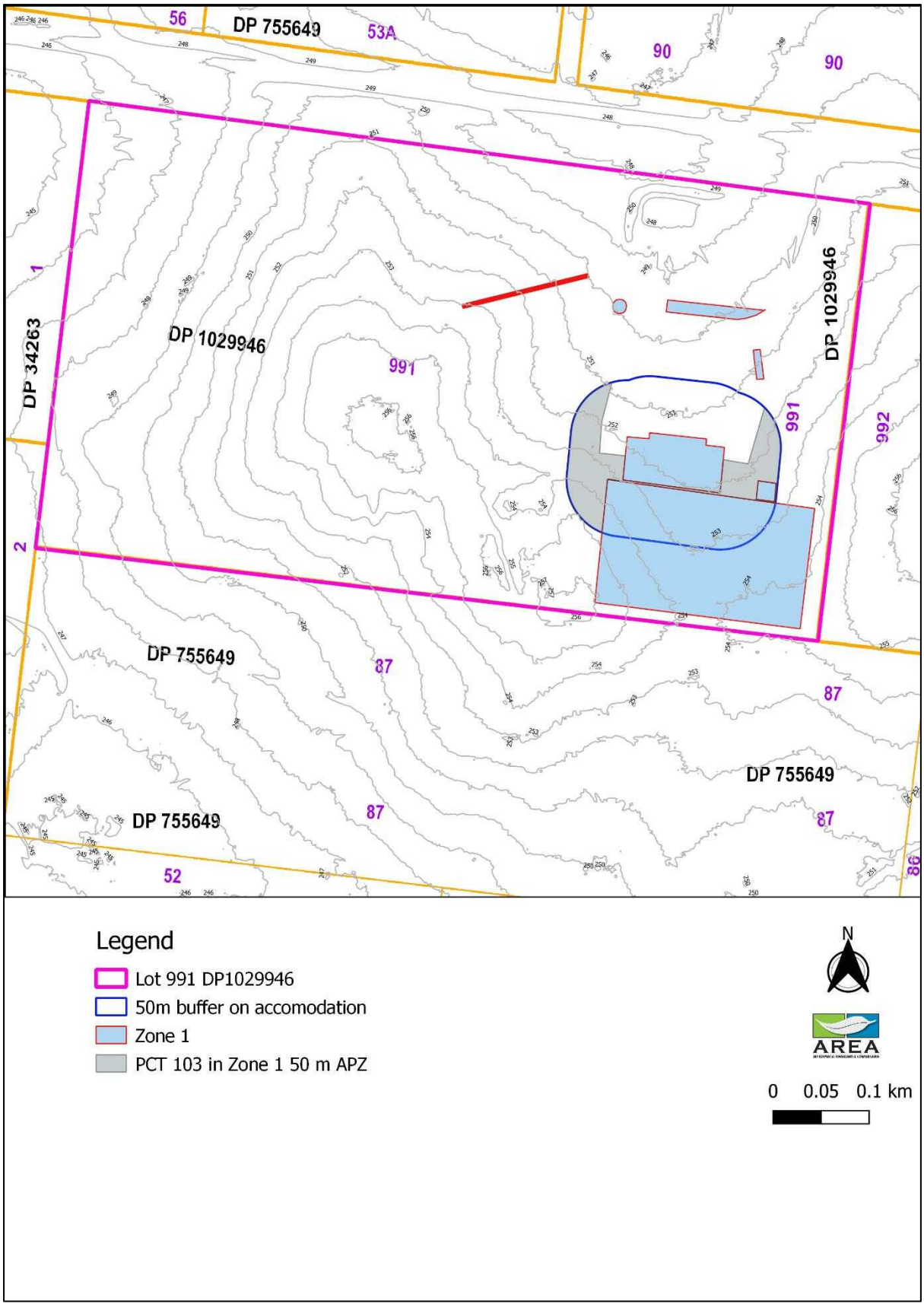


Figure 2-2: Development site cadastral



2.1.1 History of disturbance

Copper was discovered at Cobar in 1869. The Australian Town and Country Journal (Sydney, NSW: 1870 - 1907) [http://nla.gov.au/nla.news-title52] reported in part:

> *In Cobar the copper mine is in the middle of the town and is the most prominent feature in the landscape.*
>
> *Cobar is situated in a vast plain, in which a few small hills rise up at intervals. For some distance round Cobar not a tree is visible; and scarcely a green leaf is to be seen.*
>
> .

As the mine had a wood-fired smelter and nearly all building materials were locally sourced, significant areas of timber were cleared from the surrounding country. As a result of widespread removal of eucalyptus and White Cypress Pine from the region to fuel the wood-fired smelter and build infrastructure and heavy and continuous grazing by sheep and goats, the pre-European vegetation composition on the study area has changed. The land was effectively stripped and what is now called Invasive Native Species now dominates the landscape which significantly suppresses biodiversity.

Lot 991 DP1029946 was more recently an abattoir, details are scant, all is known is the site is the Former Western Plains Meats abattoir. This facility possessed an abattoir and meat processing building with amenities including toilets, showers, kitchen and washing areas. The site operated as a pet meat abattoir from 2001 to 2011. Prior land-use is unknown but expected to be agricultural.

2.1.2 The regional context of the development site

The regional context of the development site is provided in Table 2-1.

Table 2-1: Regional context of the proposal

Attribute	Response
Interim Biogeographic Regionalisation for Australia (IBRA Region)	Cobar Peneplain Bioregion. Canbelego Downs
State	New South Wales
Topographical map sheet	Wright-Ville 8034
Local Government Area	Cobar LGA
Nearest town / locality	Cobar
Accessed from nearest town by	Barrier Highway
Lot and Development Portion of the proposal	Lot 991 DP1029946.
Land use / disturbance	See section 2.1.1.
Nearest drainage line (Name, Strahler Order)	Box Creek occurs approximately within 7km from the development site. This waterway is 3rd Strahler order or greater. Un-named 1st and 2nd Strahler order drainage lines occur within 1500m of the development site.
Spot point Australian Height Datum (AHD)	Property rises slightly from a low elevation of 260m..
Surrounding land use	Grazing agriculture and mining

Regional context is depicted in Figure 2-3 and Figure 2-4.

Figure 2-3: LGA and IBRA subregions

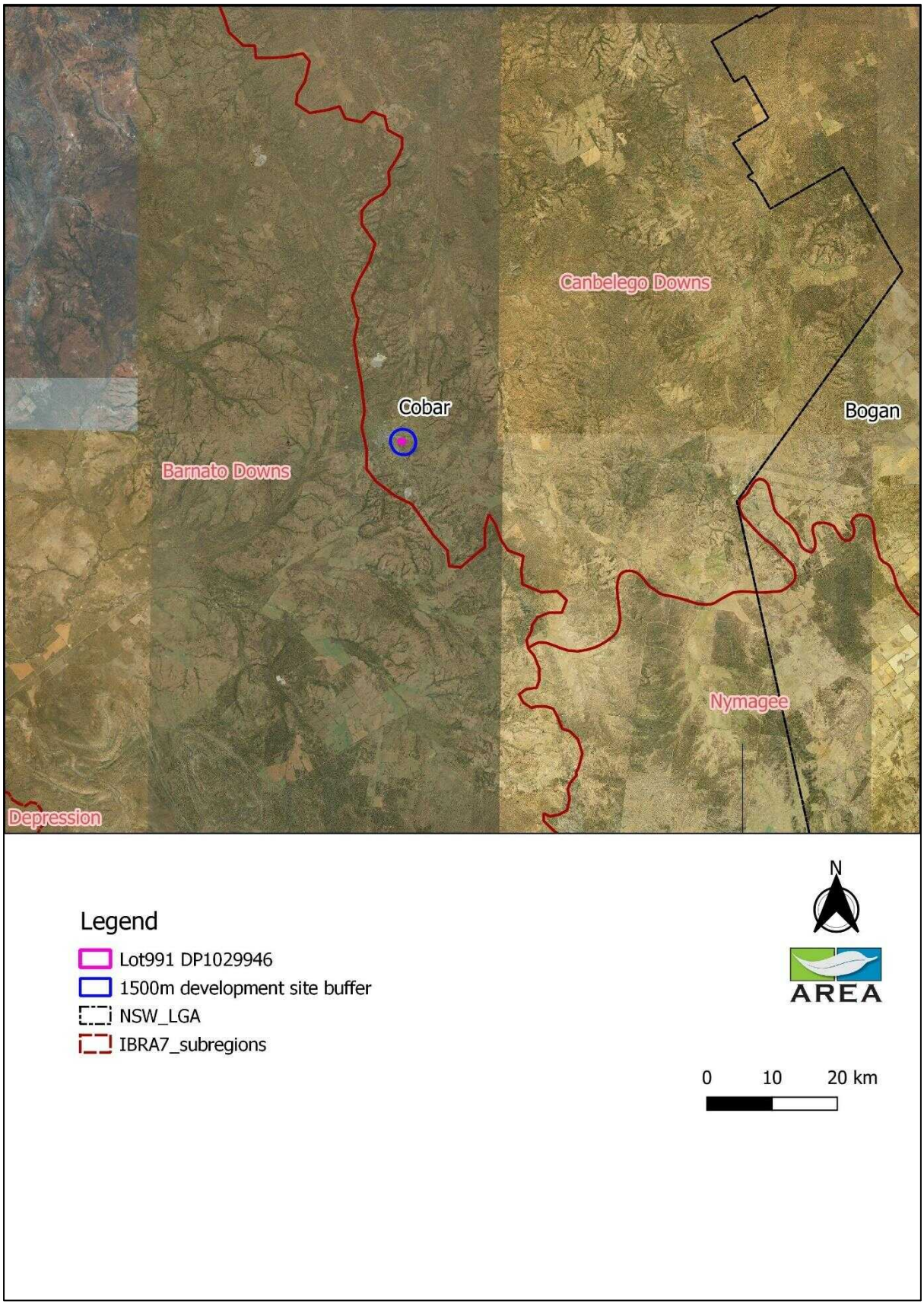
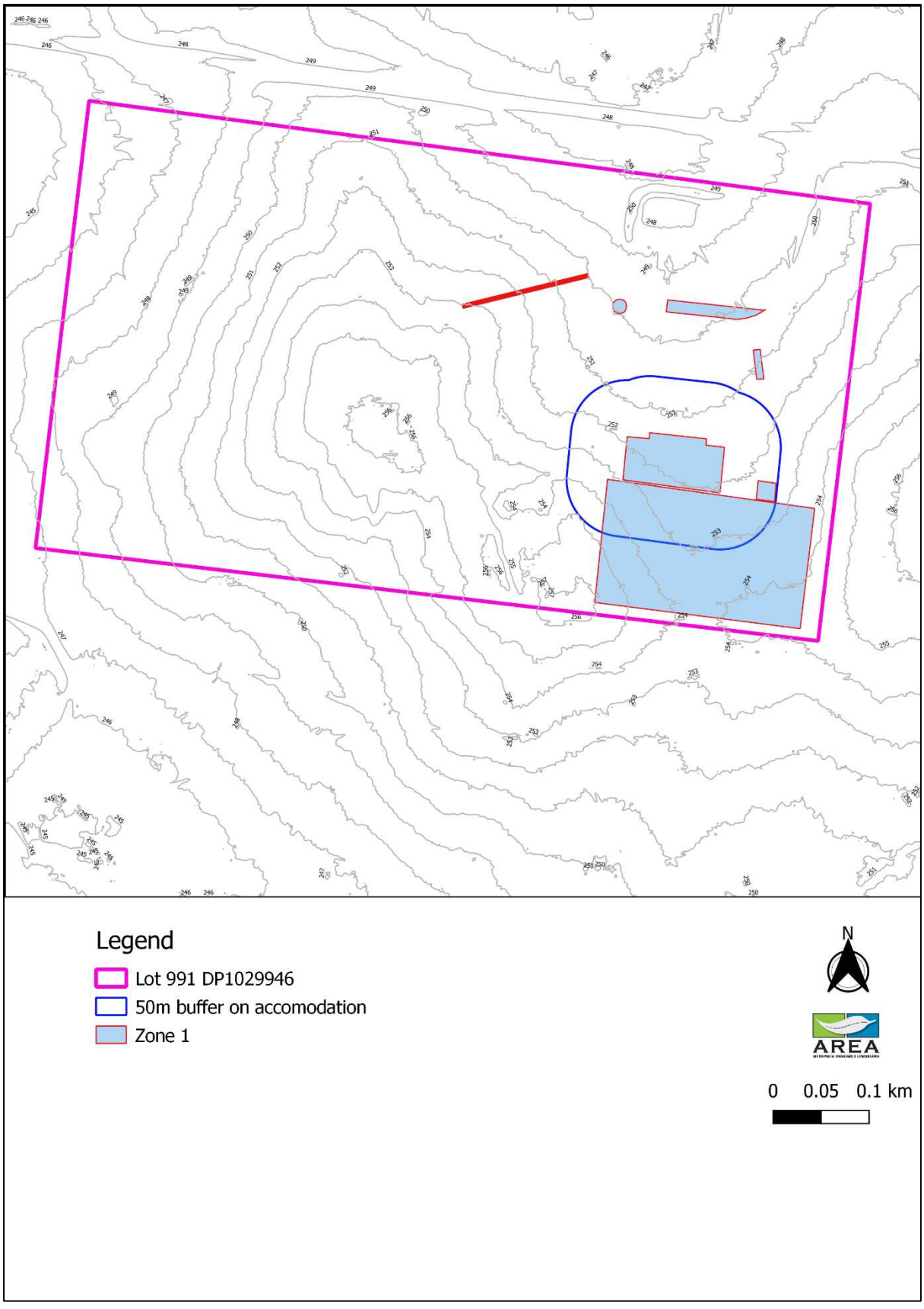


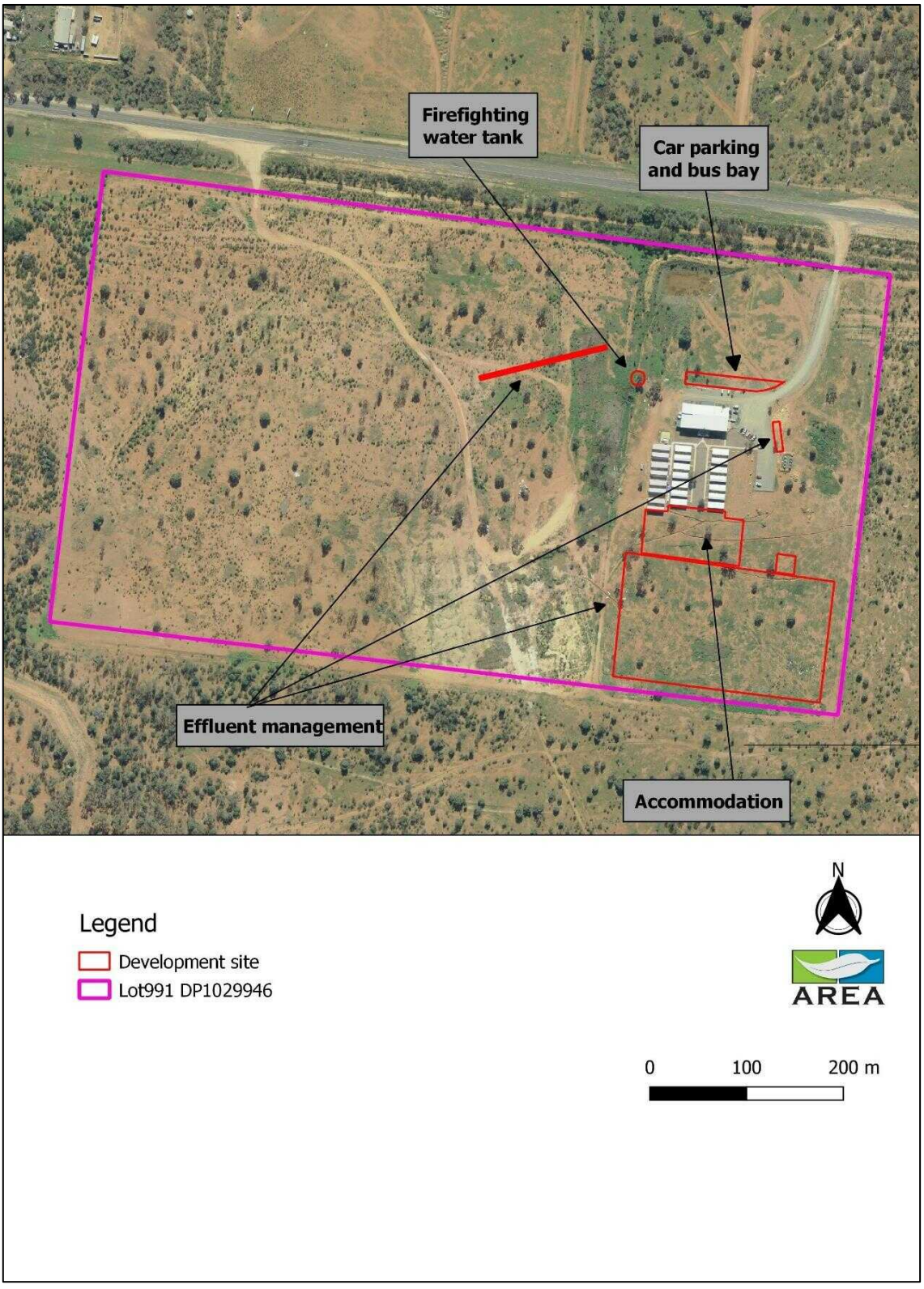
Figure 2-4: Development site topographic



2.1.3 Development site

The development site is 3.15 hectares within the area assessed by this report (Lot 991 DP1029946). Development site purpose by polygon is shown in Figure 2-5.

Figure 2-5: Development site detail



2.2 Sources of information used in the assessment, including reports and spatial data.

Information used to inform this BDAR has been provided in the following sections of this report and in Table 2-2 and Table 2-3.

2.2.1 Spatial data

Table 2-2: Spatial data used in this report

GIS layer name	Reference
IBRA bioregions and subregion	NSW data porthole
NSW landscape regions	Mitchell Landscapes V3
Rivers and streams	Six Viewer / SEED WMS topographic layer
Wetlands	Directory of Important Wetlands
Waterways	Waterways_NSW_Final
Key Fish Habitat	DPI Key Fish Habitat GIS layer
Connectivity of different areas of habitat	Western SVM 4492 veg map and Six Viewer
Native vegetation extent	Western SVM 4492 veg map and Six Viewer

2.2.2 Web sites (and links to documents)

The resources in Table 2-3 were reviewed for Stage 1 of this BDAR:

Table 2-3: Web sites and links to documents used in this report

Title	Web address
Legislation	
Commonwealth Environment Protection & Biodiversity Conservation Act 1999	http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+ 1979+cd+0+N
Fisheries Management Act 1994	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+381 +1 994+cd+0+N
National Parks and Wildlife Act 1974	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+80 +1 974+cd+0+N
Biodiversity Conservation Act 2016	https://www.legislation.nsw.gov.au/~/view/act/2016/63
Water Management Act 2000	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92 +2 000+cd+0+N
Local Land Services Act 2013	https://www.legislation.nsw.gov.au/~/view/act/2013/51
Biodiversity	
Biodiversity Assessment Methodology (OEH, 2017)	http://www.environment.nsw.gov.au/biobanking/assessmethodology.htm
BAM Credit Calculator	http://www.environment.nsw.gov.au/biobanking/calculator.htm
Threatened Species Survey and Assessment Guidelines: Field Survey Methods for Fauna – Amphibians (DECCW, 2009)	http://www.environment.nsw.gov.au/resources/threatenedspecies /09213amphibians.pdf
Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft (DEC, 2004)	http://www.environment.nsw.gov.au/resources/nature/TBSAGuid elinesDraft.pdf
Survey requirements (birds, bats, reptiles, frogs, fish and mammals) for species listed under the EPBC Act	http://www.environment.gov.au/topics/environmentprotection/environment-assessments.
Guide to Surveying Threatened Plants (OEH, 2015)	http://www.environment.nsw.gov.au/resources/threatenedspecies /160129-threatened-plants-survey-guide.pdf
Threatened biodiversity profile search	http://www.environment.nsw.gov.au/threatenedspeciesapp/
NSW BioNet	http://www.bionet.nsw.gov.au/
Vegetation Types databases	http://www.environment.nsw.gov.au/biobanking/vegtypedatabase. htm
PlantNET	http://plantnet.rbgsyd.nsw.gov.au/
Online Zoological Collections of Australian Museums	http://www.ozcam.org.au/
Threatened Species Assessment Guideline - The Assessment of Significance (DECCW,	http://www.environment.nsw.gov.au/resources/threatenedspecies /tsaguide07393.pdf

Title	Web address
2007)	
Significant Impact Guidelines 1.1 - Matters of National Environmental Significance	http://www.environment.gov.au/epbc/publications/significant-impact-guidelines-11-matters-national-environmental-significance
Principles for the use of biodiversity offsets in NSW	http://www.environment.nsw.gov.au/biodivoffsets/oehoffsetprincip .htm

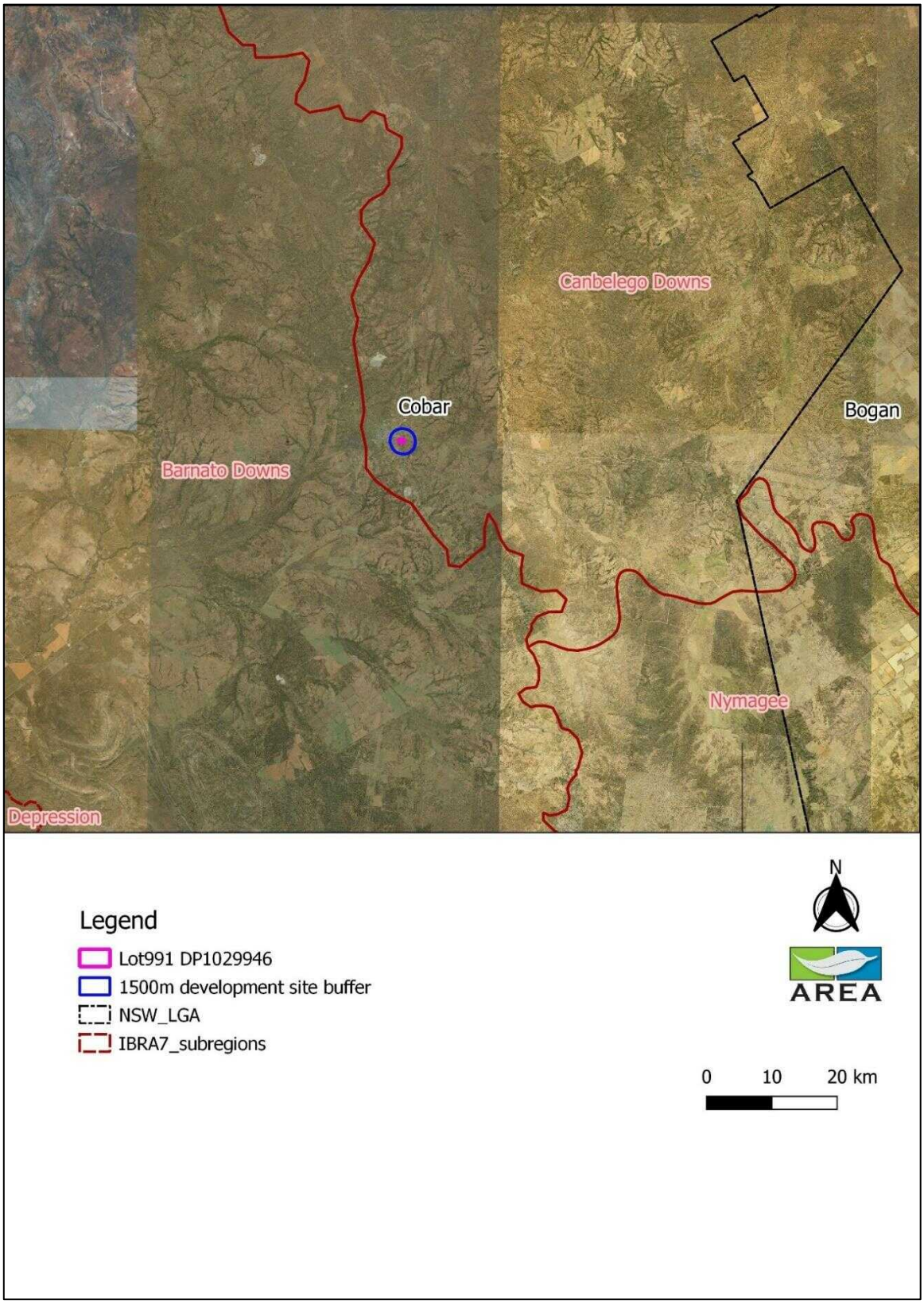
3 Landscape features

Landscape features of the development site are provided in Table 3-1.

Table 3-1: Landscape features of the proposal

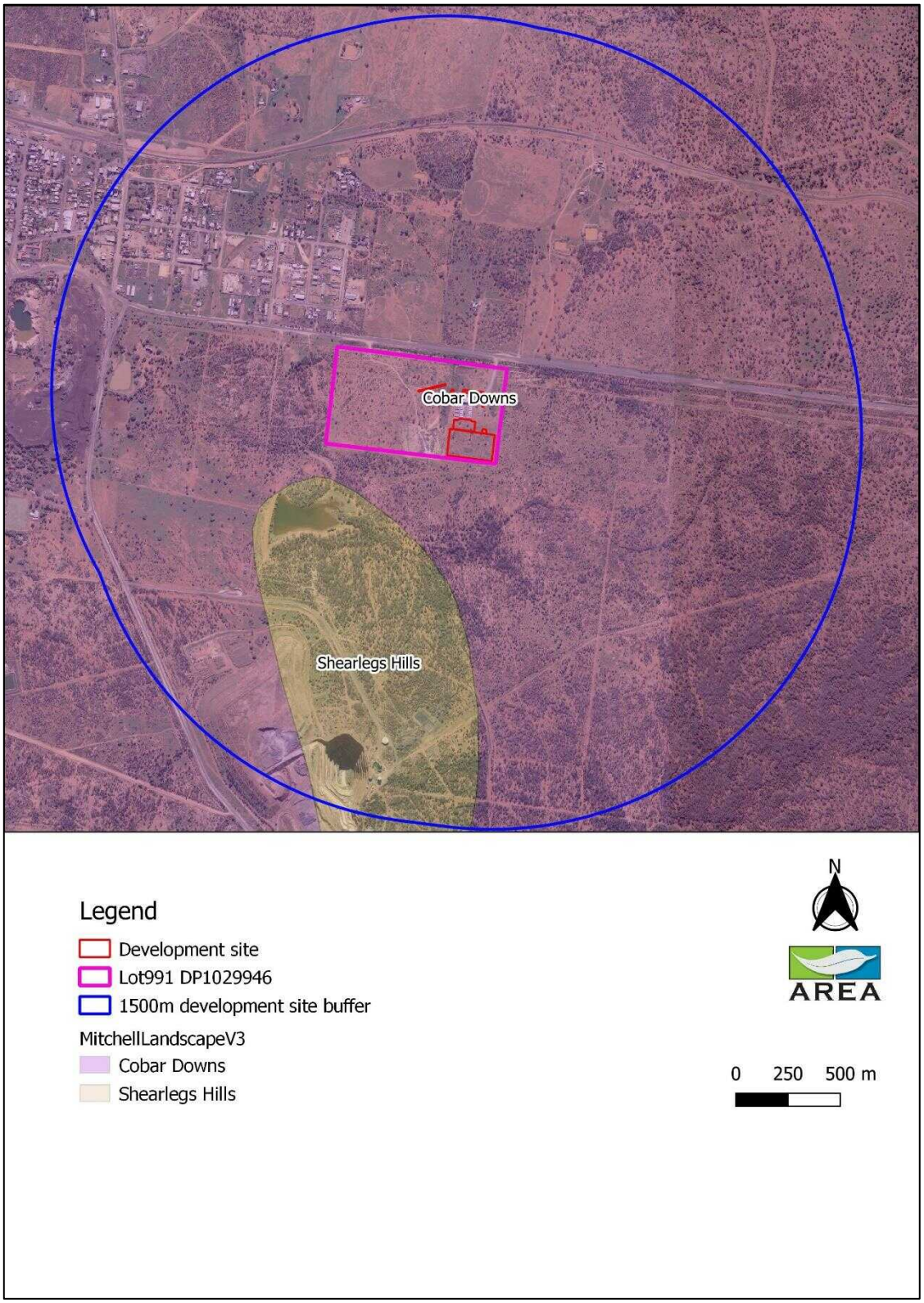
Landscape feature	BAM reference	Response
IBRA bioregions and subregions See figure below and Figure 2.2.	IBRA bioregions and subregions (as described in Paragraphs 4.2.1.3–4.2.1.4)	The Cobar Peneplain Bioregion lies in central NSW west of the Great Dividing Range. It is one of only two of the state's bioregions to occur entirely within the state, the other being the Sydney Basin Bioregion. The bioregion extends from just south of Bourke to north of Griffith, has a total area of 7,334,664 hectares, and occupies 9.2 per cent of the state. The bioregion is bounded to the north and east by the Darling Riverine Plains Bioregion, to the east by the South Western Slopes Bioregion, and by the Riverina and Murray Darling Depression Bioregions to the south and west. The north-western part of the Cobar Peneplain Bioregion falls in the Western Division. The Cobar Peneplain Bioregion encompasses the townships of Cobar, Nymagee, Byrock, Girilambone, Lake Cargelligo and Rankins Springs with Louth and Tottenham lying at its boundary. In the north of the bioregion, Yanda Creek, a major stream, discharges directly into the Darling River which meanders across the bioregional boundary in the northwest. In the east, several small streams flow occasionally into the Bogan River as it criss-crosses the eastern boundary of the bioregion (Morgan and Terrey 1992). The Lachlan River traverses the bioregion in the south with contributions of minor runoff from smaller streams (Morgan and Terrey 1992). The bioregion lies wholly within the Murray-Darling Basin and includes the Barwon, Macquarie, Yanda, Darling, Lachlan and Murrumbidgee catchments. https://www.environment.nsw.gov.au/bioregions/CobarPeneplainBioregion.htm The development site is within the Canbelego Downs subregion. **Overview of the Canbelego Downs Subregion** (Source: OEH https://www.environment.nsw.gov.au/bioregions/CobarPeneplain-Subregions.htm) **Geology** Fine grained Ordovician and Silurian metasedimentary and sedimentary rocks, such as phyllite, slate and chert. **Characteristic landforms** Undulating plateau with low stony ridges and stony rises, relief to 20m. Long low angle slopes and wide (>500m) valleys. Some central sandy channels, a few swamps. **Typical soils** Shallow red loams or stony loams on crests merging to red earths on slopes, plains and through the valley floors. Minor sand deposits along streams, yellow texture contrast soils in swamps. **Vegetation** Mulga with green mallee, red box and numerous woody shrubs on ridges and slopes. Poplar box, white cypress pine, yarran shrubs and grasses in the valleys. River red gum and polar box with sedges, lignum and nardoo in swamps and larger creeks.

Landscape feature	BAM reference	Response



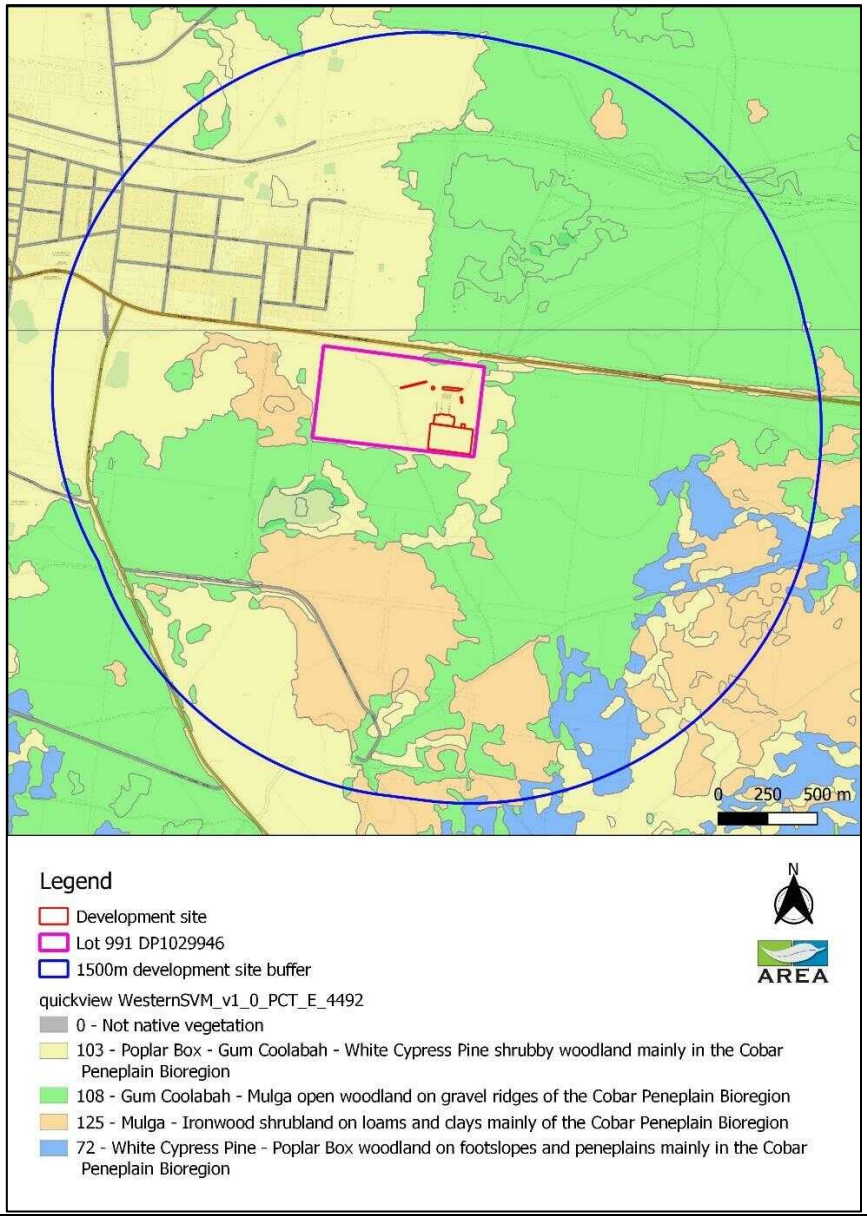
Landscape feature	BAM reference	Response
NSW landscapes region and area (hectares). See figure below.	Sections 4.2 and 4.3, Appendix 3 NSW landscape regions (as described in Paragraph 4.2.1.5)	The proposal and the associated patches of native vegetation are entirely within the Cobar Downs Mitchell Landscapes. Cobar Downs landscape includes parts of seven land systems: Cobar, Coolabah, Ironstone, Killala, Kopyje, Pirillie and Prattenville. A landscape complex of slightly undulating rounded ridges and higher residuals of many Ordovician and Silurian sedimentary and metamorphic rocks, undulating rounded Devonian sandstone ridges or low plateau, rounded ridges with siliceous and ferruginous stones from Cretaceous or Tertiary conglomerates. Occasional overlying sand dune. Well defined dendritic drainage lines vary from broad to narrow, relief 10 to 20m. Scattered rock outcrop on ridges, stony surfaces common on slopes. Shallow gravelly loamy soils, or ferruginous clay loam on ridges, grading to deeper acid and neutral red earths with hardpan down slope and calcareous red earths with areas of gilgai in drainage lines. Deep sands, sandy earths, and red earths on dunes. Moderate to dense mulga (Acacia aneura), green mallee (Eucalyptus viridis), red mallee (Eucalyptus socialis), belah (Casuarina cristata) on crests. White cypress pine (Callitris glaucophylla), bimble box (Eucalyptus populnea) western red box (Eucalyptus intertexta), wilga (Geijera parviflora), turpentine (Eremophila sturtii), budda (Eremophila mitchellii), punty bush (Senna eremophila), yarran (Acacia homalophylla), coolabah apple (Angophora melanoxylon), emu bush (Eremophila longifolia), whitewood (Atalaya hemigluaca), hopbush (Dodonaea sp.) and ironwood (Acacia excelsa) with many other woody species and grasses on slopes. Bimble box, white cypress pine, broad-leaved hopbush (Dodonaea viscosa), budda and curly windmill grass (Enteropogon acicularis) along drainage lines. Coolabah apple and quinine bush (Alstonia constricta) on dunes.

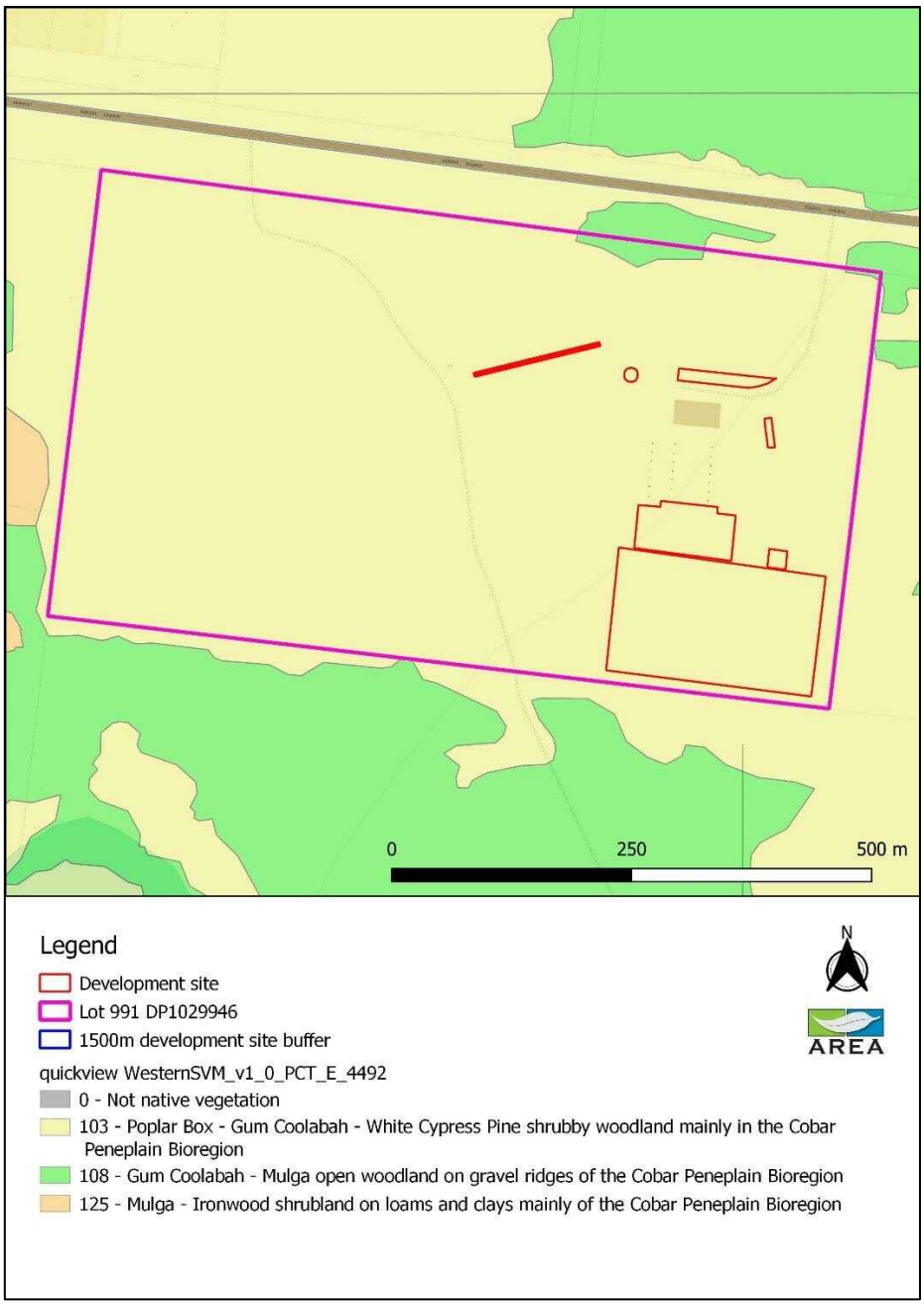
Landscape feature	BAM reference	Response



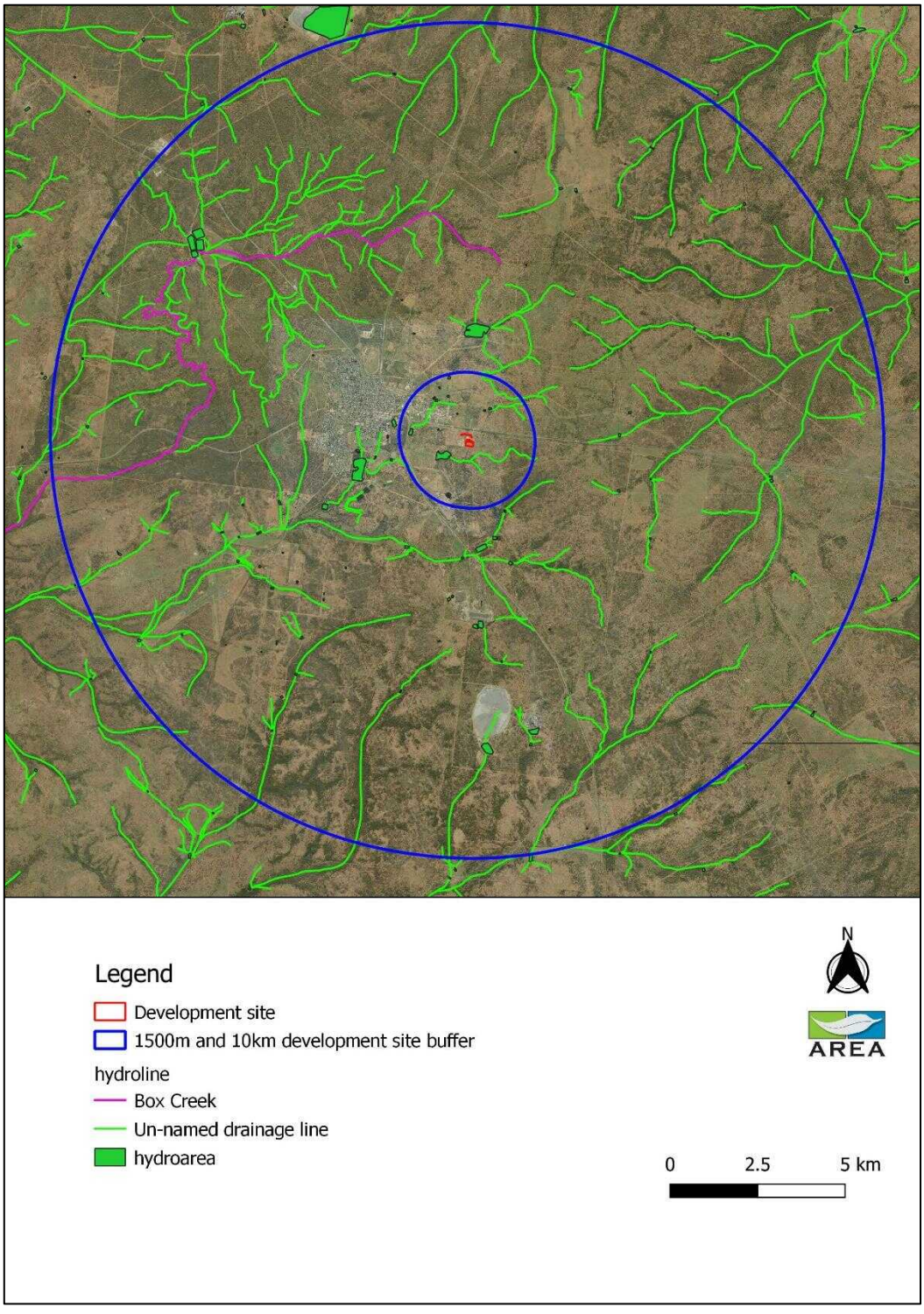
<table>
<tr><th>Landscape feature</th><th>BAM reference</th><th>Response</th></tr>
<tr><td>Native vegetation extent in the buffer* area

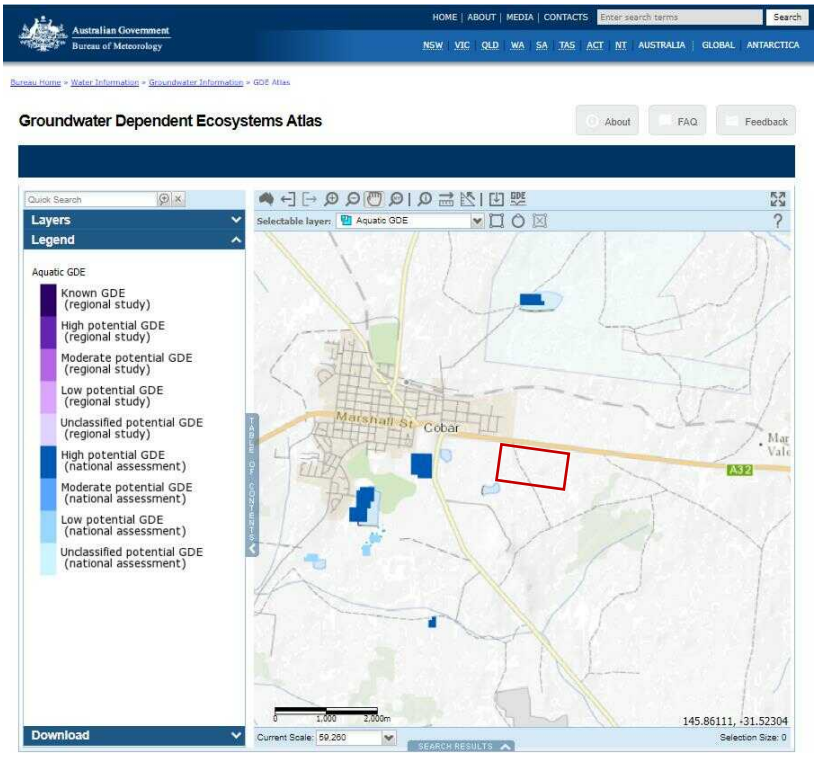
See figure below – areas of no shading indicate ‘not native’.

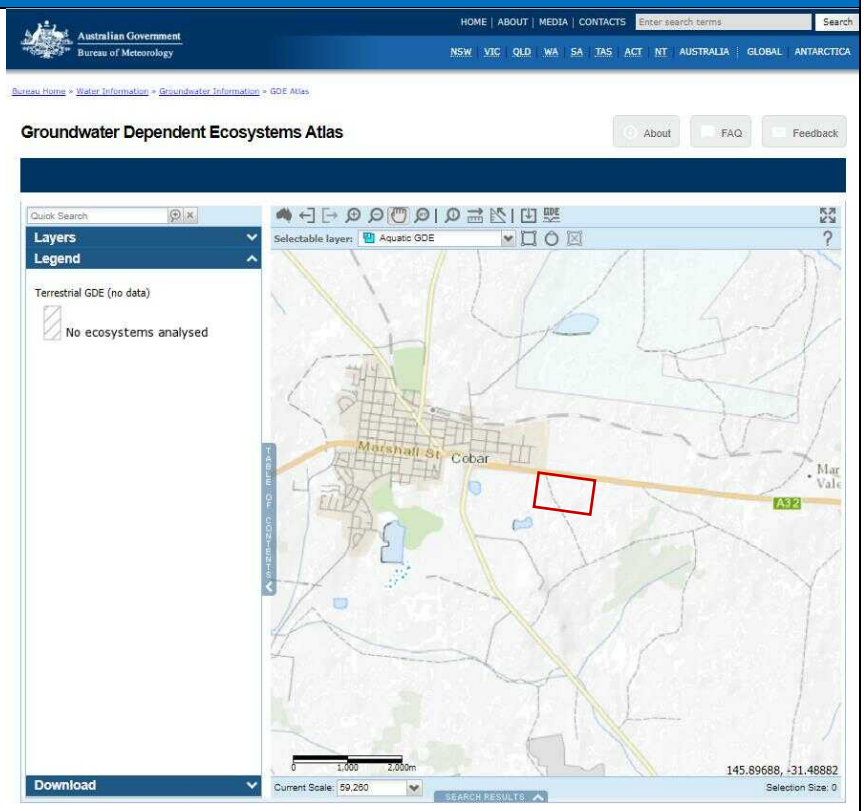
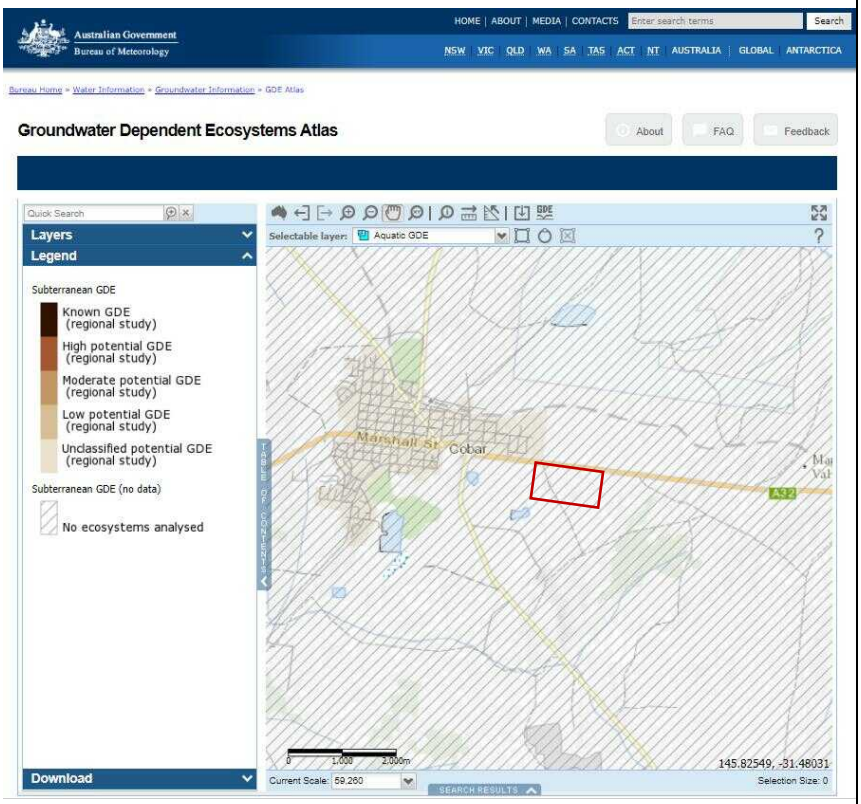
* Within 1500 metres</td><td>Native vegetation extent (as described in Subsection 4.3.2)</td><td>All areas within a 1500m buffer, except for mapped roads, is native vegetation (See figure below). The native vegetation cover in the landscape was determined by QGIS software with reference to vegetation maps provided by the Western SVM 4492. Native vegetation cover per cent was calculated as a proportion of all land within the assessment buffer area containing mapped native vegetation and is comprised of the following Plant Community Types:
<table>
<tr><th colspan="2">PCTs within 1500 metre buffer around the property (12070.14 hectares)</th></tr>
<tr><td>72</td><td>White Cypress Pine - Poplar Box woodland on footslopes and peneplains mainly in the Cobar Peneplain Bioregion</td></tr>
<tr><td>125</td><td>Mulga - Ironwood shrubland on loams and clays mainly of the Cobar Peneplain Bioregion</td></tr>
<tr><td>103</td><td>Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion</td></tr>
<tr><td>108</td><td>Gum Coolabah - Mulga open woodland on gravel ridges of the Cobar Peneplain Bioregion</td></tr>
<tr><td>Not Native</td><td>N/A</td></tr>
</table>
</td></tr>
<tr><td colspan="3">SVM – 1500m
 
</td></tr>
</table>

Landscape feature	BAM reference	Response
SVM Development site  		
Rivers and streams classified according to stream order. See figure below.	Rivers and streams (as described in Paragraph 4.2.1.6)	Un-named, non-perennial, 1st and 2nd Strahler order drainage lines occur within 1500m of the development site. One named waterway, Box Creek, occurs seven kilometres from the development site.

Landscape feature	BAM reference	Response



Landscape feature	BAM reference	Response
Wetlands within, adjacent to and downstream of the site. See figure above	Wetlands (as described in Paragraph 4.2.1.7)	No wetlands of International Importance occur in the property 10 kilometre buffer. Farm dams occur within 1500m of the development site.
Groundwater dependant ecosystems		Groundwater plays an important ecological role in directly and indirectly supporting terrestrial and aquatic ecosystems. Groundwater sustains terrestrial and aquatic ecosystems by supporting vegetation and providing discharge to channels, lacustrine and palustrine wetlands, and both the estuarine and marine environment. Aquifer ecosystems are inherently groundwater dependent (DEHP, 2017). The BoM GDE map showed no Aquatic GDE in Lot 991 DP1029946. The BoM GDE map showed no ecosystems analysed for Terrestrial GDE and Subterranean GDE. 

Landscape feature	BAM reference	Response
		 

Landscape feature	BAM reference	Response
Connectivity features	Connectivity of different areas of habitat (as described in Paragraphs 4.2.1.8–4.2.1.11)	A connectivity site-based assessment was undertaken in accordance with the BAM. No formal state or regional biodiversity links are recorded across the development site. The vegetation in the development site is open and very lightly wooded. Areas of more dense vegetation occur outside the development site and Lot 991 DP1029946, which extends to wooded and riparian vegetation for more than 100km.
Areas of geological significance and soil hazard features	Areas of geological significance and soil hazard features (as described in Paragraphs 4.2.1.12–4.2.1.15)	No rocky areas exist in the development site, and do not occur within 1500m of the proposal. Cliff, cave or karst formations do not occur within 10 km of the development site.
Site context: identification of method applied (i.e. linear or site-based)		The proposal is a site-based project.
Site context: percent native vegetation cover in the landscape (proposal).	Section 4.3.2	The proposal (the impact footprint) is 3.15 hectares, of this all is native vegetation except where roads exist (almost 100 percent native vegetation).

4 Native vegetation

4.1 Plant community types (PCTs) within the development site

One PCT was recorded in the development site: *PCT103 - Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion* (Table 4-1).

This PCT was confirmed to occur on site using the following pieces of evidence:

- PCT103 was mapped at the site on the Western SVM PCT 4492 GIS layer.
- The vegetation at Lot 911 DP1029946 was consisted with this PCT floristically as all except one species (*Myoporum montanum*) recorded in the BAM vegetation plots is listed in the PCT description. These species are:
    - *Geijera parviflora*
    - *Eremophila longifolia*
    - *Rhagodia spinescens*
    - *Eremophila sturtii*
    - *Acacia aneura*
    - *Sclerolaena birchii*
    - *Sida corrugate*
- Other species consistent with the species listed in the PCT description which were observed on the site, though not captured in the BAM plots include:
    - *Callitris glaucophylla*
    - *Eucalyptus populnea subsp. Bimbil*
    - *Dodonaea viscosa subsp. Angustissima*
    - *Eremophila mitchellii*
    - *Brachychiton populneus subsp. Populneus*
- Description consistent with IBRA bioregion and subregion
- Consistent with landform and lithology

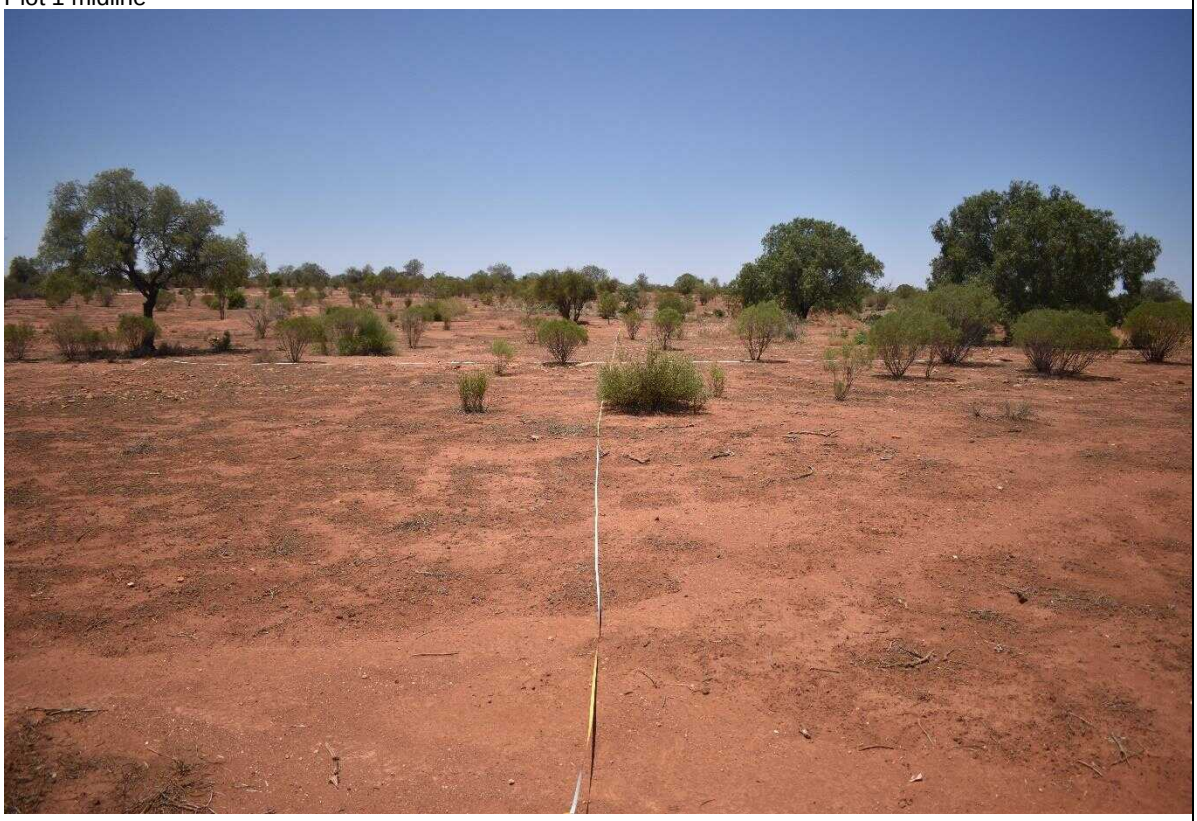
No other evidence existed to justify altering the PCT from the mapped PCT103.

Table 4-1: PCT103 - Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion - Vegetation zone, PCT and management zone

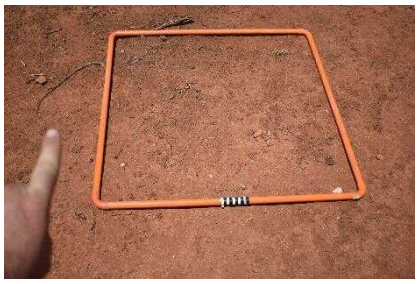
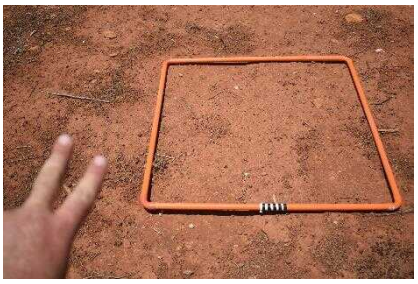
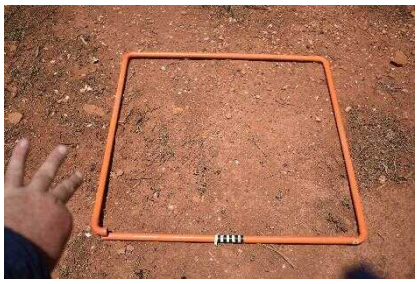
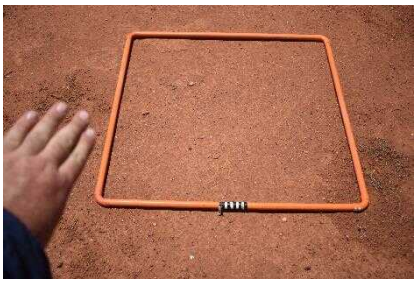
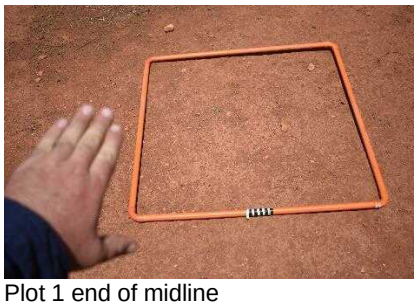
PCT 510: Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	
Vegetation zones:	Zone 1 – 3.15ha (Including 50m APZ for accommodation area)
PCT Code:	103
Vegetation formation:	Semi-arid Woodlands
Vegetation class:	Western Peneplain Woodlands
Conservation status:	Not associated with a Threatened Ecological Community
PCT Percent cleared:	50
Composition condition score (BAMC): Zone 1	6.9
Structure condition score (BAMC): Zone 1	13.9
Function condition score (BAMC): Zone 1	2
Current vegetation integrity score (BAMC): Zone 1	5.8
Extent in the Proposal: Zone 1	3.15
Plots completed in vegetation zones: Zone 1	1 and 2

An overview of vegetation attributes collected from the plot data is provided in section 4.2.3.

Plot 1 midline

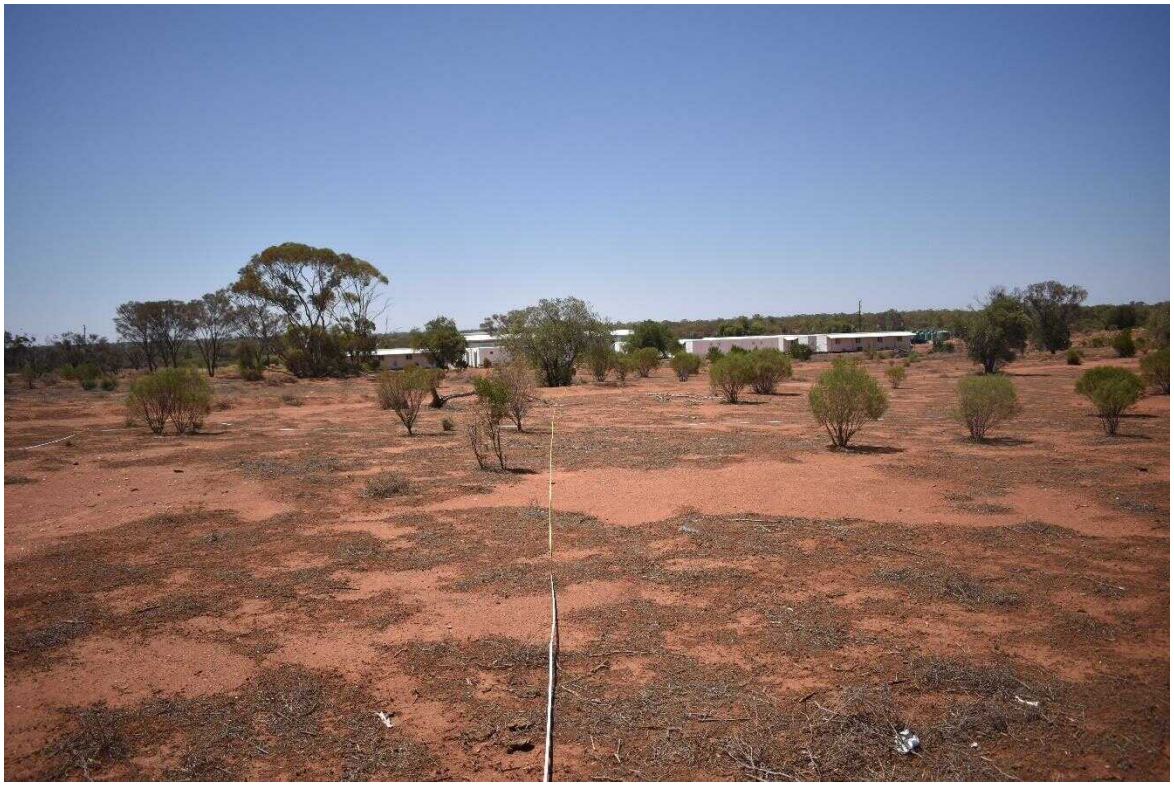


Plot 1 Leaf Litter Plots

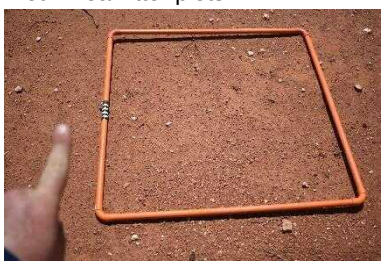
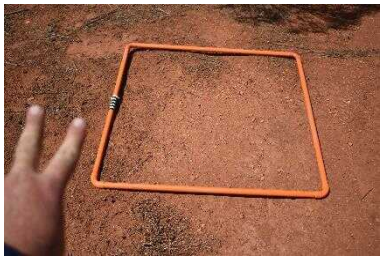
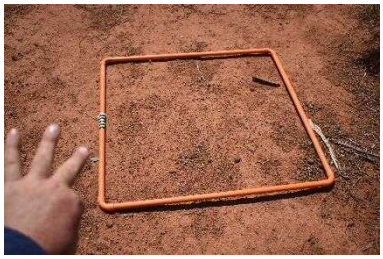






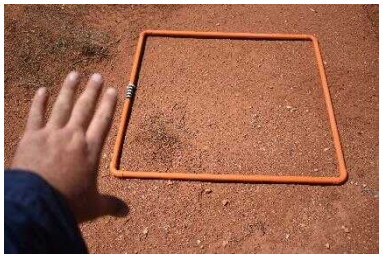
Plot 1 end of midline

Plot 2 Midline



Plot 2 Leaf litter plots



Plot 2 end of midline

Description (VIS BioNet Profile):
PCT103 is an open woodland to 25 m high dominated by Poplar Box (Eucalyptus populnea subsp. bimbil) often with Gum Coolabah (Eucalyptus intertexta) and White Cypress Pine (Callitris glaucophylla). A dense to sparse shrub cover is present consisting of Wilga (Geijera parviflora), Budda (Eremophila mitchellii), Tar Bush (Eremophila glabra), various subspecies of Sticky Hop Bush (Dodonaea viscosa sens lat.), Bertya cunninghamii, Acacia deanei subsp. paucijuga, Emubush (Eremophila longifolia), Senna artemisioides s. lat. and Rhagodia spinescens. The ground cover is composed of small shrubs such as Maireana microphylla and copper burrs (Sclerolaena spp.). Grasses include Austrostipa scabra subsp. scabra, Aristida jerichoensis var. subspinulifera, Chloris truncata, Enteropogon acicularis and Monachather paradoxus. Forbs are very sparse and include Vittadinia and Calotis spp. Occurs on clay loam, sandy loam or lateritic soils on alluvial flats, footslopes and broad ridges of undulating plains mainly in the Cobar Peneplain Bioregion of central-western NSW with annual rainfall 350 - 450 mm. This community covers a large section of north-central NSW and varies in its understorey depending on soils and land use. It grades into Mulga communities to the west and White Cypress Pine dominated communities in the south. It grades into Eucalyptus intertexta woodland (ID104) upslope or on rockier ground, or Green Mallee or Eucalyptus dwyeri communities on ridges. This community is subject to woody regrowth of native shrubs including patches of Callitris glaucophylla. While this community is mainly not targeted for clearing is often cleared when adjoining grassy Poplar Box woodland is cleared (ID105). Clearing of woody native shrubs may inadvertently reduce tree cover.

Landform Pattern: Peneplain, Sand plain
Landform Element: Drainage depression, Plain, Valley flat
Site and Regional Distribution: An estimated 50 percent of this PCT has been cleared. Clearing for grazing agriculture, mining, timber resource use and other development has occurred.
Diagnostic features: Open woodland to 25 m high. Occurs on clay loam, sandy loam or lateritic soils. This community covers a large section of north-central NSW and varies in its understorey depending on soils and land use.
Threatened ecological community: Not listed or associated with a Threatened Ecological Community.
Fauna habitat features: This area of woodland has been previously developed and some regrowth is occurring. The site is considered degraded in terms of fauna habitat features.

Condition (on site observation): The development site has been historically cleared and was the site of an abattoir. Flora has low species richness and fauna habitat features including hollows and fallen logs were not recorded in the development site or in the vegetation plots.

The Vegetation Integrity Score is 5.8

4.2 Vegetation integrity assessment of the development site

4.2.1 Mapping vegetation zones (Subsection 5.3.1 of the BAM)

Vegetation zones are defined as a 'relatively homogeneous area of native vegetation within a proposal that is the same PCT and broad condition state' (OEH 2014a). In this assessment, one zone was recorded.

Vegetation within the development site was identified and mapped as one zone. This zone was consisted with the PCT and condition at the location of all three BAM vegetation plots.

Table 4-2: Identification of vegetation zones in the proposal

Zone	PCT ID	Plant Community Type (PCT) Name	Hectares in 1500 metre buffer	Hectares in development site
1	103	Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	Approx. 431	3.15
		Native veg	Approx. 53%	Total 3.15
		Other vegetation or not native	Approx. 47%	Total 0

Figure 4-1: Vegetation zone

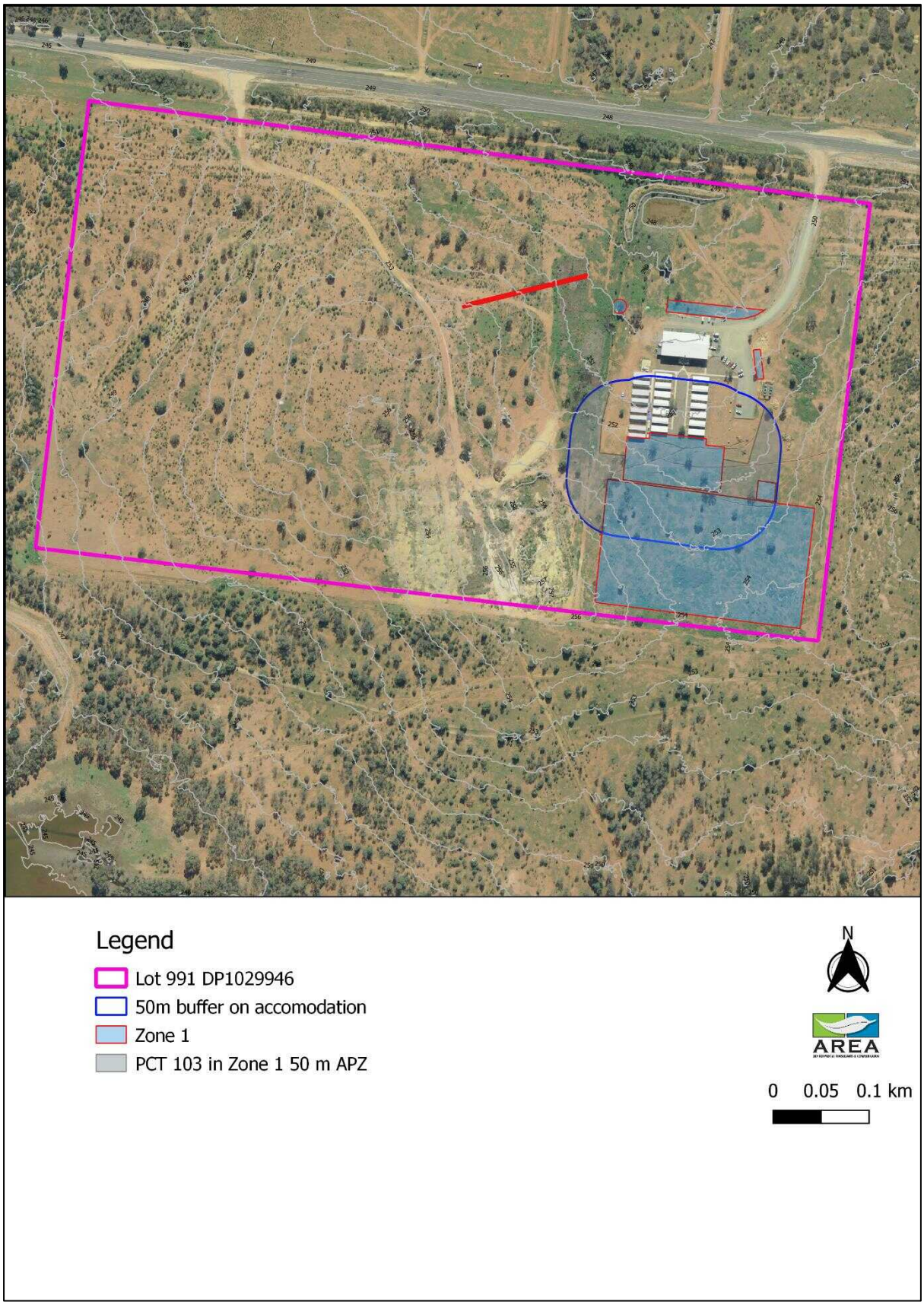
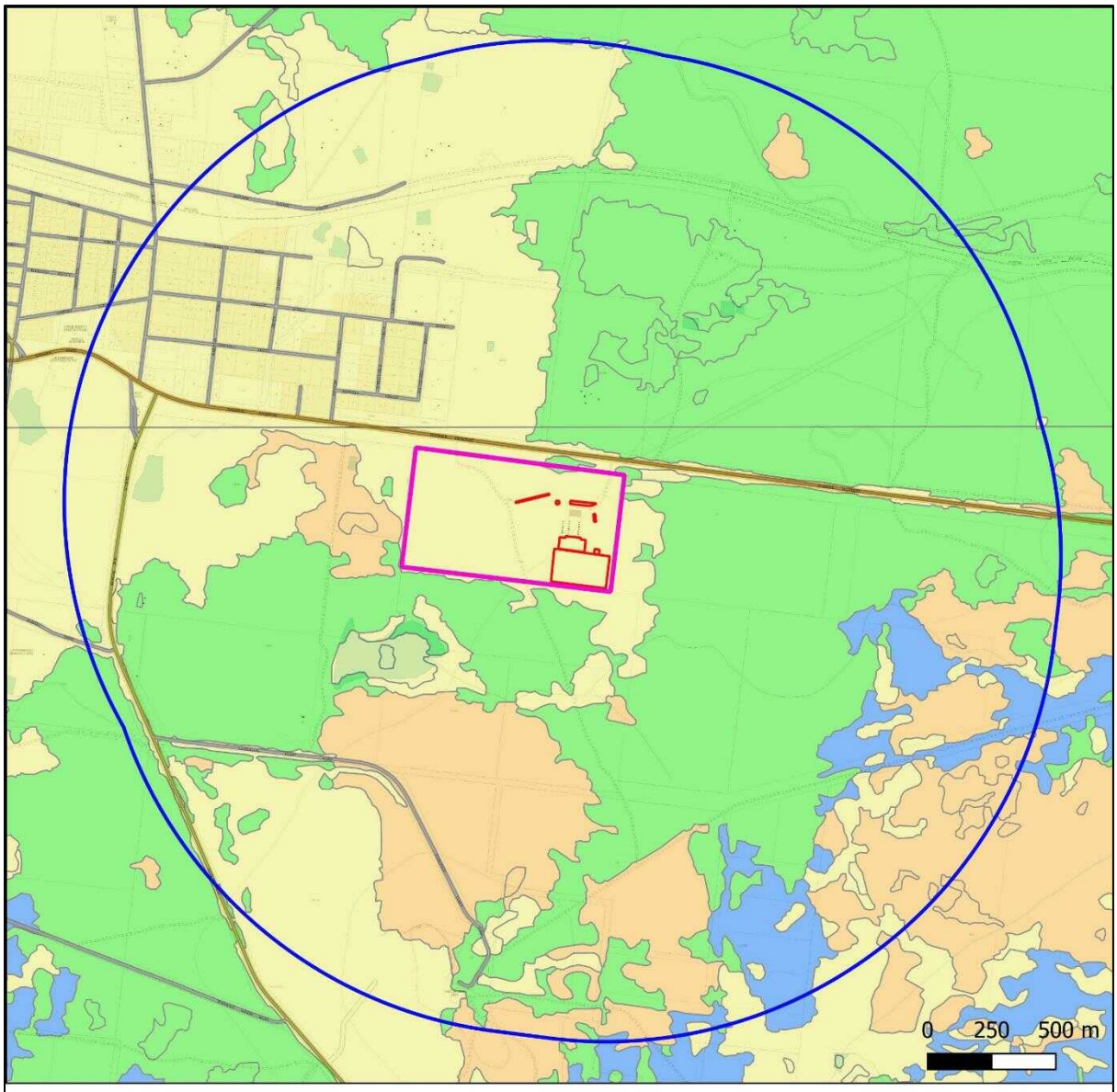


Figure 4-2: Vegetation map within 1500m (VIS) of development sites



4.2.2 Patch size (Proposal)

The mapped patch size of PCT103 associated with the development site is greater than 1000 hectares and extends through Cobar and out to the north west of Cobar.

4.2.3 Assessing vegetation integrity using benchmark data

Data collected from each plot was measured against the benchmark values for the PCT. Each parameter was further considered by whether it achieved more than 25% of the benchmark values.

Table 4-3: Plot data against PCT benchmark data

PCT103 Benchmark			Comparison	
Vegetation Class	Western Peneplain Woodlands			
IBRA	Cobar Peneplain			
Benchmark Calculation Level		25% of benchmark value	Plot 1	Plot 2
Tree Richness	3	0.75	0	0
Shrub Richness	7	1.75	7	0
Grass and Grass Like Richness	6	1.5	0	0
Forb Richness	9	2.25	2	1
Fern Richness	1	0.25	0	0
Other Richness	1	0.25	0	0
Tree Cover	18	4.5	0	0
Shrub Cover	11	2.75	6.2	3.1
Grass and Grass Like Cover	6	1.5	0	0
Forb Cover	3	0.75	0	0
Fern Cover	0	0	0	0
Other Cover	0	0	0	0
Total length of fallen logs	26	6.5	0	0
Litter Cover	30	7.5	4.8	12.4
Number of Large Trees	3	0.75	0	0
Large Tree Threshold Size	30			

Key to table:

Less than 25% of the benchmark
More than 25% of the benchmark (within benchmark)

Purple text = Composition score

Green text = structure score

Black text = Function score

4.2.4 Survey effort as described in Subsection 5.3.4 (number of plots)

The field data collected using two BAM (2017) plots is presented Appendix A.

The following site attributes were assessed in the plots to obtain a quantitative measure of vegetation condition.

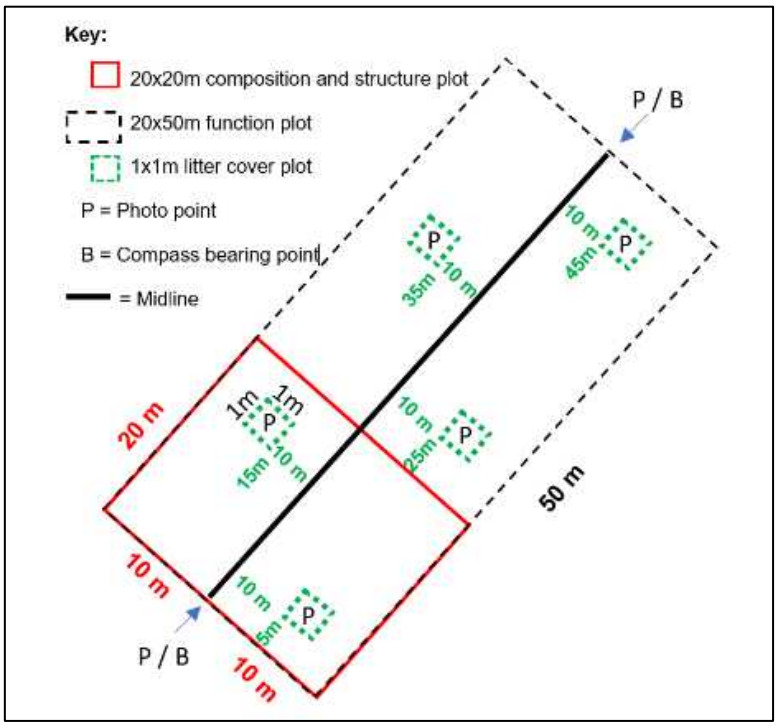
- **Composition score** based on the number of native plant species (richness) recorded by the assessor within the 20 metre x 20 metre plot boundary for each growth form group (Figure 4-3)
- **Structure score** based on the assessment of foliage cover for each growth form group within the 20 metre x 20 metre plot boundary
    - Foliage cover for a growth form group is the percentage of cover of all living plant material of all individuals of the species (Figure 4-3).
- **Function score** based on the number of large trees, tree stem size class, tree regeneration, tree hollows and length of fallen logs is recorded within a 20 metre x 50 metre plot boundary (Figure 4-3)
- Additionally, a High Threat Exotic weed assessment was undertaken.

Plot-based floristic survey

Vegetation in each plot was assessed with 20 by 20 metre quadrats nested inside 20 by 50 metre transects. The following information was collected:

- Stratum and layer – in which each species occurs.
- Growth form – for each recorded species.
- Species name – above ground vascular plant species were identified to the lowest taxonomic order possible using nomenclature consistent with PlantNet NSW.
- Cover – a measure or estimate of the appropriate cover measure for each recorded species; recorded from one to five per cent and then to the nearest five per cent. If the cover of a species is less than one per cent and the species is considered important, then the estimated cover should be entered (e.g. 0.4).
- Abundance rating – a relative measure of the cover abundance of individuals or shoots of each species within the plot was estimated and assigned a cover abundance score using the BAM.

Figure 4-3: BAM plot layout (not to scale)



The vegetation survey was completed using field survey methods in line with Chapters 5 and 6 of the BAM and by implementing the guidelines for *Threatened Biodiversity Survey and Assessment* (DEC, 2004) and *NSW Guide to Surveying for Threatened Plants* (2016). AREAs Principal Consultant and Principal Environment and Community Consultant completed surveys for this proposal:

- One day of field survey which included:
  - strategic vegetation survey following the Biodiversity Assessment Method 2017
  - targeted threatened species searches and relevant threatened species search protocols.

Table 4-4: Minimum number of transects / plots required per vegetation zone area

Vegetation zone area (hectares)	Minimum number of transects/plots (Table 4: BAM)
<2	1 plot/transect
>2–5	**2 plots/transects**
>5–20	3 plots /transects
>20–50	4 plots/transects
>50–100	5 plots/transects
>100–250	6 plots/transects
>250–1000	7 plots/transects; more plots may be needed if the condition of the vegetation is variable across the zone
>1000	8 plots/transects; more plots may be needed if the condition of the vegetation is variable across the zone

Plot data to assess the vegetation to be impacted by this proposal was conducted in Lot 911 DP1029946 within which the development site is situated.

A total of three BAM vegetation plots were conducted. While none of these plots are within the development site boundary, the field assessment enabled the assessor to confirm the development site is within the same zone as that represented by the vegetation plots. Hence, the three vegetation plots from within Lot991 DP1029946 have been used for this BDAR.

The area of the development site is 3.15 hectares. Two are required for this assessment.

The survey effort for all threatened flora was consistent with the document published by OEH: *NSW Guide to Surveying Threatened Plants 2016.* Two surveyors walked 10 to 20m spaced transects across development sites.

Preliminary understanding of the vegetation was by inspection of the Western SVM 4492. This mapping was then ground-truthed during the site assessment.

Vegetation zones were assigned by comparing the dominant canopy species, general description of location and landscape position, soil type and other attributes described in the TSPD (OEH 2016b) and OEH online VIS classification database (OEH 2016c).

4.2.5 Determining the vegetation integrity score (Appendix 6 of the BAM):

The vegetation integrity scores according to the BAMC are:

- Zone 1 (3.15 hectares) is 5.8.

Impact to Zone 1 will not trigger offsetting as the vegetation integrity score is less than 17 as per section 10.3.1 of BAM for a community which is not a threatened ecological community but may include threatened species habitat.

Figure 4-4: vegetation integrity score

Zone	Area (ha)	Composition condition score	Structure condition score	Function condition score	Current vegetation integrity score
1	3.15	6.9	13.9	2	5.8

4.3 Local data

Local benchmark data of BAM plots collected on the property have not been used for this assessment.

5 Threatened species

The following section addresses the potential presence of threatened flora and fauna species to be considered in the assessment of impacts and targeted surveys:

- Ecosystem credit species (predicted species) are predicted to occur based on their known presence or predicted presence in the IBRA subregion, the known association with PCTs and the size and condition of the vegetation patches on the site.
- Species credit species (candidate species) are those that cannot be reliably predicted from the habitat surrogates and their presence is to be assessed through habitat assessment and targeted surveys. When species credit species have habitat constraints within the development site, they require further consideration.

A default list of threatened species with potential to occur in the proposal was firstly identified using the assessment filtering tool in the BAMC. A background review was also conducted to confirm these and possible additional threatened species using the resources shown in Table 5-1.

Table 5-1: Wildlife databases used to identify potentially occurring threatened species

Database / resource	Search area	Date accessed
BAM credit calculator (BAMC)	Cobar Peneplain – Canbelego Downs IBRA > Cobar Downs > PCT103	16 Oct 2019
OEH NSW Atlas of Wildlife	10km buffer around the development site	July 2019
Protected Matters Search Tool (DEE)	1 kilometre radius around point in centre of the lot/ DP.	17 July 2019
OEH Threatened Species Profile Database (TSPD)	IBRA subregion - Canbelego Downs	July 2019

Threatened species known to occur based on recorded sightings recorded on the OEH BioNet Species Sightings Database (Table 5-2 and Figure 5-1).

Table 5-2: Threatened species known within 10 kilometres of the development site (BioNet)

Species shaded in green were recorded within 1500m of the development site (one record each)

Class Name	Scientific Name	Common Name	NSW Status	Comm Status	No of records
Aves	*Ninox connivens*	Barking Owl	V P 3		1
Aves	*Falco subniger*	Black Falcon	V P		1
Aves	*Oxyura australis*	Blue-billed Duck	V		1
Mammalia	*Onychogalea fraenata*	Bridled Nailtail Wallaby	Extinct (E4) P	E	1
Aves	*Grus rubicunda*	Brolga	V P		1
Aves	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V P		1
Aves	*Tringa nebularia*	Common Greenshank	P	C J K	1
Flora	*Acacia curranii*	Curly-bark Wattle	V	V	3
Aves	*Stagonopleura guttata*	Diamond Firetail	V P		1
Aves	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V P		5
Aves	*Plegadis falcinellus*	Glossy Ibis	P	C	1
Flora	*Pterostylis cobarensis*	Greenhood Orchid	V P		1
Aves	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V P		10
Aves	*Melanodryas cucullata cucullata*	Hooded Robin (south-eastern form)	V P		9
Mammalia	*Antechinomys laniger*	Kultarr	Endangered (E1) P		5
Aves	*Hieraaetus morphnoides*	Little Eagle	V P		9

Class Name	Scientific Name	Common Name	NSW Status	Comm Status	No of records
Mammalia	*Chalinolobus picatus*	Little Pied Bat	V P		1
Mammalia	*Rattus villosissimus*	Long-haired Rat	V P		1
Aves	*Lophochroa leadbeateri*	Major Mitchell's Cockatoo	V P 2		3
Aves	*Tringa stagnatilis*	Marsh Sandpiper	P	C J K	1
Aves	*Grantiella picta*	Painted Honeyeater	V P	V	2
Aves	*Certhionyx variegatus*	Pied Honeyeater	V P		5
Aves	*Merops ornatus*	Rainbow Bee-eater	P	J	2
Aves	*Calidris acuminata*	Sharp-tailed Sandpiper	P	C J K	1
Aves	*Polytelis swainsonii*	Superb Parrot	V P 3	V	1
Aves	*Daphoenositta chrysoptera*	Varied Sittella	V P		1
Flora	*Lepidium monoplocoides*	Winged Peppercress	E1	E	2
	E = Endangered V = Vulnerable P = Protected	C = China bilateral agreement J = Japan bilateral agreement K = Korea bilateral agreement			

Figure 5-1: BioNet results within 10 kilometres of the development site

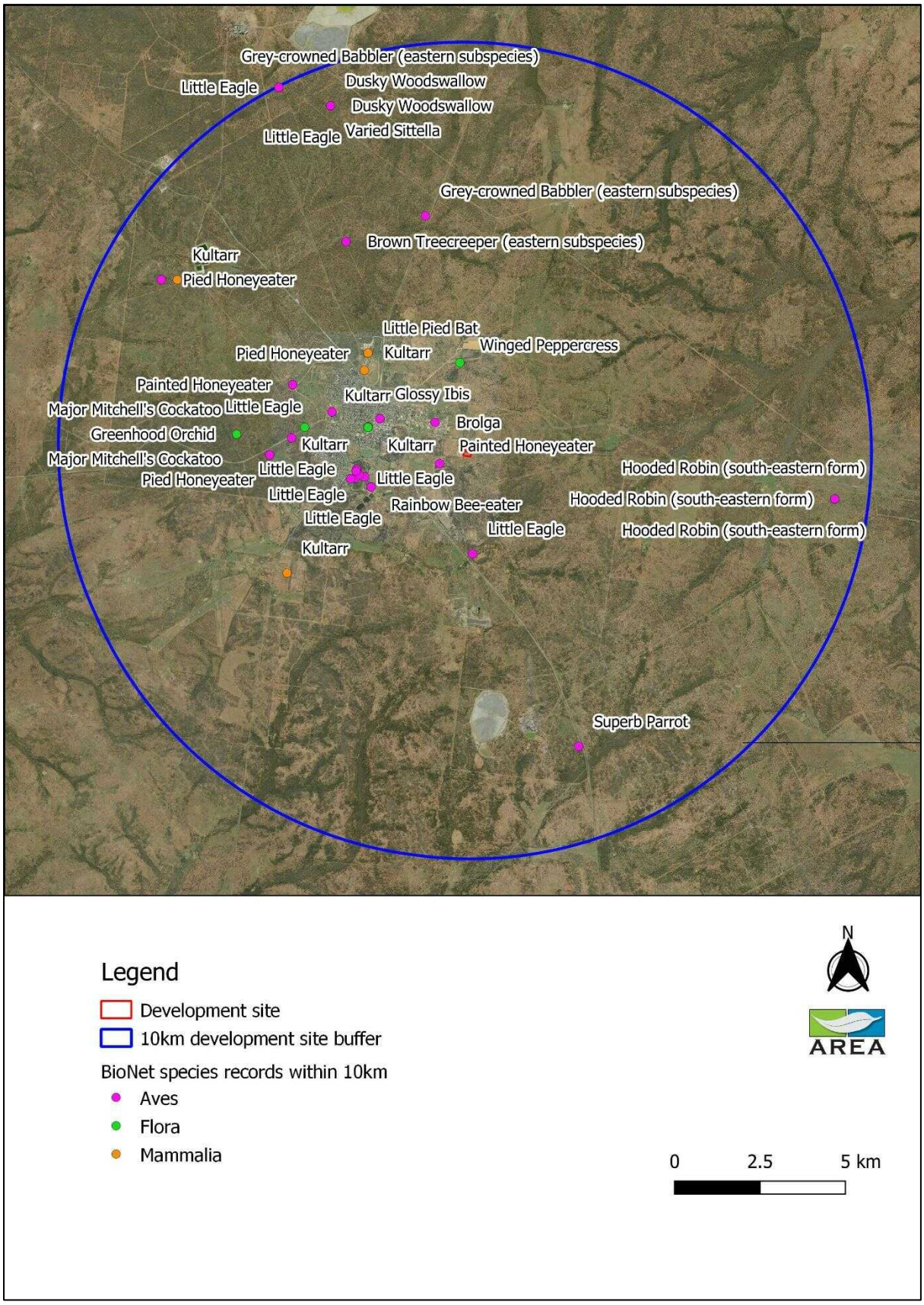
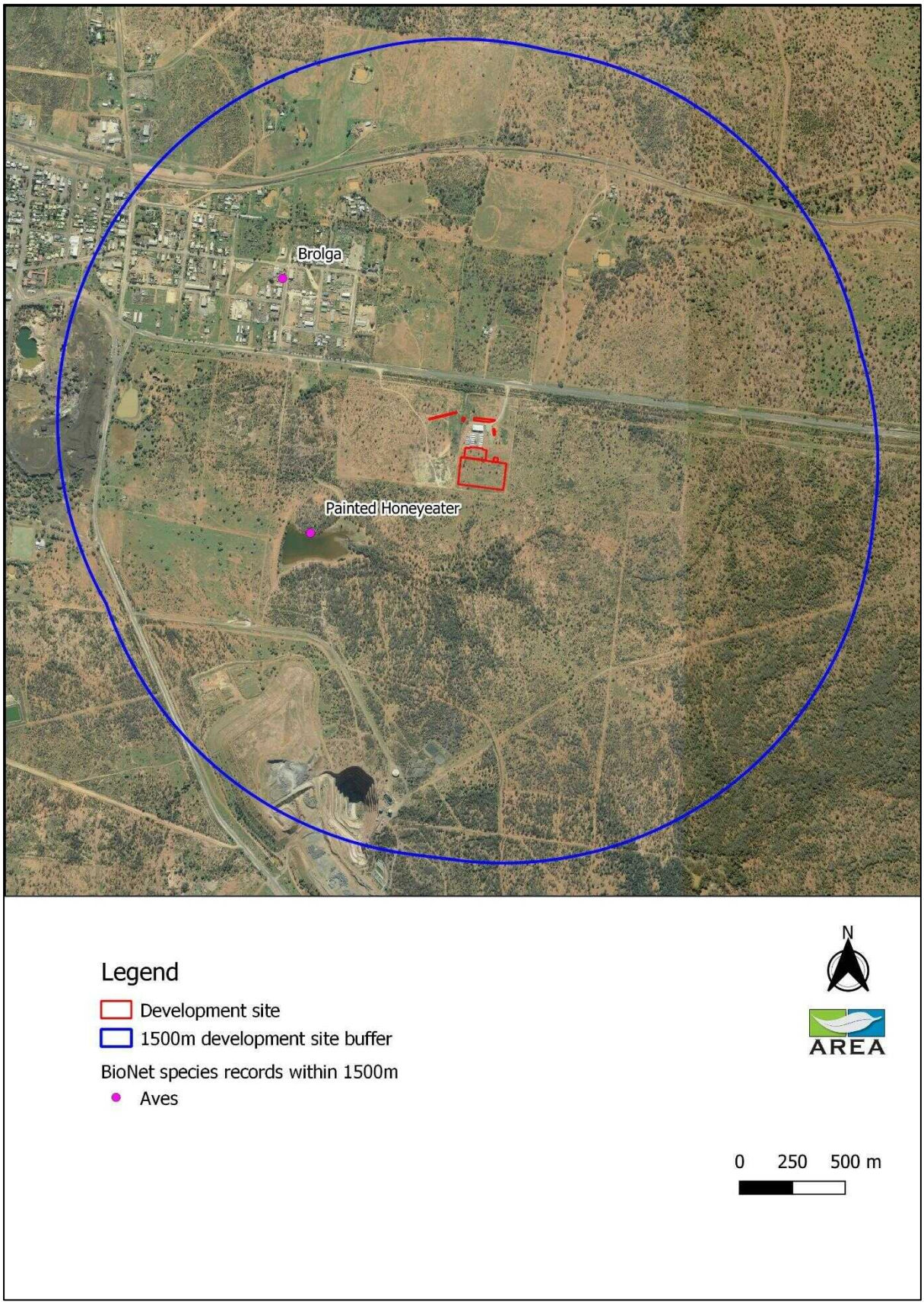


Figure 5-2: BioNet results within 1500 metres of the development site



5.1 Ecosystem credit species associated with PCTs on the development site as outlined in Section 6.2 of BAM

The BAMC assessment tool identified 24 threatened species reliably predicted to use the development site (Table 5-3). Species are assumed to be present unless habitat constraints are not present, geographic limitations apply or the species is vagrant.

5.1.1 List of ecosystem credit species derived

The derived ecosystem credit species as generated by the BAMC is provided in Table 5-3.

Table 5-3: Threatened species reliably predicted to utilise PCT103 Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion.

Scientific name	Common name	Habitat constraints	Sensitivity to gain class	NSW listing status	National listing status.
Antechinomys laniger	Kultarr	N/A	High Sensitivity to Potential Gain	Endangered	Not Listed
Artamus cyanopterus cyanopterus	Dusky Woodswallow	N/A	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Calyptorhynchus lathami	Glossy Black-Cockatoo (Foraging)	Presence of Allocasuarina and other casuarina species	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Certhionyx variegatus	Pied Honeyeater	N/A	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Chalinolobus picatus	Little Pied Bat	N/A	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Chthonicola sagittata	Speckled Warbler	N/A	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Circus assimilis	Spotted Harrier	N/A	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Daphoenositta chrysoptera	Varied Sittella	N/A	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Falco hypoleucos	Grey Falcon	N/A	Moderate Sensitivity to Potential Gain	Endangered	Not Listed
Grantiella picta	Painted Honeyeater	Mistletoes present at a density of greater than five mistletoes per hectare	Moderate Sensitivity to Potential Gain	Vulnerable	Vulnerable
Haliaeetus leucogaster	White-bellied Sea-Eagle (Foraging)	Within 1km of a river, lake large dam or creek, wetland and coastline	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Hamirostra melanosternon	Black-breasted Buzzard	N/A	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Hieraaetus morphnoides	Little Eagle (Foraging)	N/A	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Lophochroa leadbeateri	Major Mitchell's Cockatoo	N/A	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed

Scientific name	Common name	Habitat constraints	Sensitivity to gain class	NSW listing status	National listing status.
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	N/A	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	N/A	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Ninox connivens	Barking Owl (Foraging)	N/A	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Nyctophilus corbeni	Corben's Long-eared Bat	N/A	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
Pachycephala inornate	Gilbert's Whistler	N/A	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Phascolarctos cinereus	Koala (Foraging)	N/A	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
Polytelis swainsonii	Superb Parrot (Foraging)	N/A	Moderate Sensitivity to Potential Gain	Vulnerable	Vulnerable
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies	N/A	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	N/A	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Stagonopleura guttata	Diamond Firetail	N/A	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed

5.1.2 Justification for exclusion of any ecosystem credit species predicted

Scientific name	Common name	Reason	Justification
Grantiella picta	Painted Honeyeater	Habitat constraint not present	Mistletoes are not present at required density. No mistletoes observed in the development site.
Haliaeetus leucogaster	White-bellied Sea-Eagle (Foraging)	Habitat constraint not present	Development site is not within 1km of a large water body.

5.2 Identify species credit species in the development site

This section has BAMC outputs showing which species credit species are predicted by the BAMC in the development site.

Species credit species can be excluded if habitat constraints are not present, the habitat is degraded, geographic limitations apply, or the species is degraded, or site assessment confirms the species or habitat for the species is not available.

After the field assessment this list of species credit species was reviewed and exclusions from the BAMC candidate species list were made as appropriate.

5.2.1 List of candidate species

Sixteen species credit species were identified by the BAMC as having potential to use habitat in the development site.

Table 5-4: Candidate species credit species (BAMC)

Scientific name	Common name	Sensitivity to gain class	NSW listing status	National listing status.
Acacia curranii	Curly-bark Wattle	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
Antaresia stimsoni	Stimson's Python	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Burhinus grallarius	Bush Stone-curlew	High Sensitivity to Potential Gain	Endangered	Not Listed
Calyptorhynchus lathami	Glossy Black-Cockatoo (Breeding)	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Diuris tricolor	Pine Donkey Orchid	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Geophaps scripta scripta	Squatter Pigeon (southern subspecies)	High Sensitivity to Potential Gain	Critically Endangered	Vulnerable
Haliaeetus leucogaster	White-bellied Sea-Eagle (Breeding)	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Hamirostra melanosternon	Black-breasted Buzzard (Breeding)	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Hieraaetus morphnoides	Little Eagle (Breeding)	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Lophochroa leadbeateri	Major Mitchell's Cockatoo (Breeding)	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Ninox connivens	Barking Owl (Breeding)	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Phascolarctos cinereus	Koala (Breeding)	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
Polytelis swainsonii	Superb Parrot (Breeding)	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
Pterostylis cobarensis	Greenhood Orchid	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Setirostris eleryi	Bristle-faced Free-tailed Bat	High Sensitivity to Potential Gain	Endangered	Not Listed
Sida rohlenae	Shrub Sida	High Sensitivity to Potential Gain	Endangered	Not Listed

5.2.2 Justification for exclusion of any species credit species predicted

Twelve species have been excluded from further assessment. This is justified in Table 5-5.

Table 5-5: Species credit species excluded from further survey

Scientific name	Common name	Reason	Explanation	Relevant survey effort
Acacia curranii	Curly-bark Wattle	Not present Habitat constraints are not present	Site surveyed and this species was not recorded. Species requires Rock areas or rocky slopes and ridges, or within 100m of break of slope.	Two people walking search transects across the development site. Vegetation in the development site is sparse and this plant and required habitat features could have been easily seen.
Antaresia stimsoni	Stimson's Python	Habitat constraints are not present	This species requires rocky areas or areas within 500m of rocks or gibber.	Two people walking search transects across the development site. Vegetation in the development site is sparse and required habitat features could have been easily seen.
Burhinus grallarius	Bush Stone-curlew	Habitat constraints are not present	This species requires fallen/ standing dead timber. Suitable dead timber was not recorded in the BAM plots and was not observed in the development site.	Two people walking search transects across the development site. Vegetation in the development site is sparse and required habitat features could have been easily seen
Calyptorhynchus lathami	Glossy Black-Cockatoo (Breeding)	Habitat constraints are not present	This species requires how bearing trees or living or dead tree with hollows greater than 15cm diameter and greater than 5m above the ground. Hollows suitable for this species to breed do not occur in the development site.	Two people walking search transects across the development site. Vegetation in the development site is sparse and required habitat features could have been easily seen. No hollows were recorded.
Diuris tricolor	Pine Donkey Orchid	Habitat is degraded	The development site has been historically cleared and managed for industry. This species is unlikely to have persisted through this land use. The development site has very low ground cover, very sparse vegetation and low flora species richness and is generally degraded.	Two people walking search transects across the development site. Vegetation in the development site is sparse and flora species richness is low.
Geophaps scripta scripta	Squatter Pigeon (southern subspecies)	Habitat is degraded	Grassy woodlands and plains, preferring sandy areas and usually close to water. They feed on the ground, on seeds of grasses, herbs and shrubs, as well as insects.	Two people walking search transects across the development site. Vegetation in the development site is sparse and flora species richness is low.

Scientific name	Common name	Reason	Explanation	Relevant survey effort
			Ground cover is very sparse, species richness is low and grasses were not recorded in the BAM plots. This site is unlikely to provide the food, or the cover provided by grassy ground cover required by this species.	
Lophochroa leadbeateri	Major Mitchell's Cockatoo (Breeding)	Habitat is degraded	This species requires hollows greater than 10cm diameter. Hollows suitable for this species to breed do not occur in the development site. No hollows were recorded in the development site or in the BAM plots.	Two people walking search transects across the development site. Vegetation in the development site is sparse and required habitat features could have been easily seen. Three BAM plots were completed.
Ninox connivens	Barking Owl (Breeding)	Habitat is degraded	This species requires hollows greater than 20cm diameter and greater than 4m above the ground. Hollows suitable for this species to breed do not occur in the development site. No hollows were recorded in the development site or in the BMA plots	Two people walking search transects across the development site. Vegetation in the development site is sparse and required habitat features could have been easily seen. Three BAM plots were completed.
Phascolarctos cinereus	Koala (Breeding)	Habitat is degraded	Habitat in the development site is not of sufficient quality to be important habitat for the koala. Tree density is low, food tree abundance is low and trees are young.	Two people walking search transects across the development site. Three BAM plots were completed.
Polytelis swainsonii	Superb Parrot (Breeding)	Habitat is degraded	Hollows suitable for this species to breed do not occur in the development site. Superb Parrot breeding does not occur in this area of the state.	Two people walking search transects across the development site. Vegetation in the development site is sparse and required habitat features could have been easily seen. Three BAM plots were completed.
Pterostylis cobarensis	Greenhood Orchid	Habitat is degraded	The development site has been historically cleared and managed for industry. This species is unlikely to have persisted through this land use. The development site has very low ground cover, very sparse vegetation and low flora species richness and is generally degraded.	Two people walking search transects across the development site. Vegetation in the development site is sparse and flora species richness is low.
Setirostris eleryi	Bristle-faced Free-tailed Bat	Habitat is degraded such that roosting habitat is not present.	This species is expected to require tree hollows and fissures for roosting. Tree hollows and trees with fissures are not present in the development site.	Two people walking search transects across the development site. Vegetation in the development site is sparse and required habitat features could have been easily seen. Three BAM plots were completed.

5.2.3 Indication of listed flora or fauna presence based on targeted survey or expert report

Four threatened species were identified in the BAM as requiring further assessment:

- White-bellied Sea-Eagle – *Haliaeetus leucogaster*
- Black-breasted Buzzard – *Hamirostra melanosternon*
- Little Eagle – *Hieraaetus morphnoides*
- Shrub Sida – *Sida rohlenae*

Survey for these species or their habitat determined they were unlikely to be present, or habitat is not available at the site. Justification and survey effort are described in Table 5-6.

Table 5-6: Species Credit candidate species/ habitat surveyed

Scientific name	Common name	Explanation	Relevant survey effort
Haliaeetus leucogaster	White-bellied Sea-Eagle (Breeding)	Site not within 1km of a large waterbody	The development site and Lot 991 DP1029946 was searched. The local area was considered using aerial imagery and observations during the site assessment.
Hamirostra melanosternon	Black-breasted Buzzard (Breeding)	No evidence of past or current nesting.	Two people walking search transects across the development site. Vegetation in the development site is sparse No large stick nests recorded on Lot 991 DP1029946, including the development site.
Hieraaetus morphnoides	Little Eagle (Breeding)	No evidence of past or current nesting.	Two people walking search transects across the development site. Vegetation in the development site is sparse No large stick nests recorded on Lot 991 DP1029946, including the development site.
Sida rohlenae	Shrub Sida	Species not present	Two people walking search transects across the development site. Vegetation in the development site is sparse and this plant was not recorded in search transects.

5.2.4 Species polygons

No species polygons are required for this assessment.

5.2.5 Details of targeted survey technique, effort, timing and weather

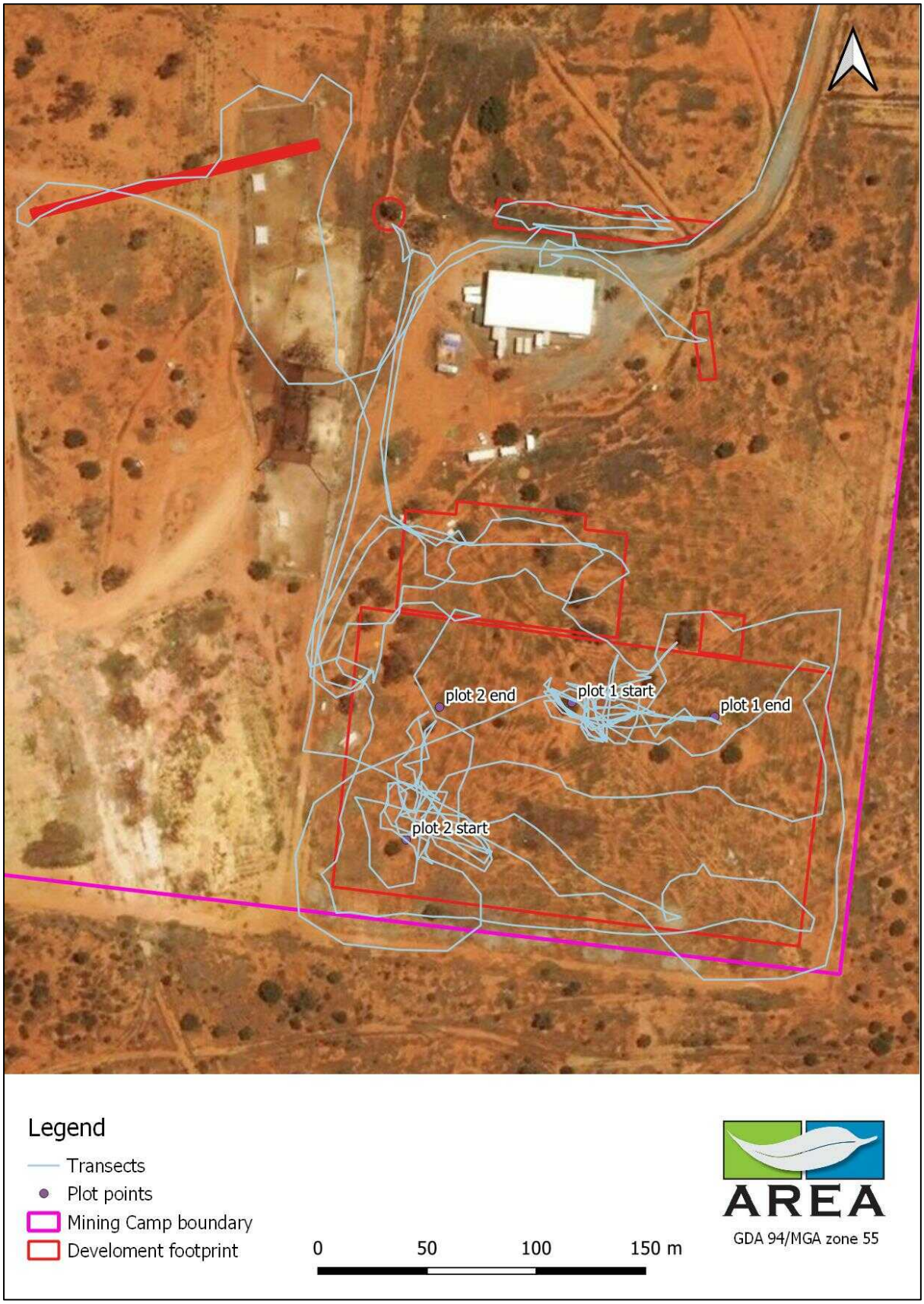
Terrestrial flora surveys

Targeted flora surveys occurred on 21 March 2019. During this time BAM vegetation plots were completed, and threatened species search transects were conducted.

Targeted flora surveys in the development site were undertaken for all identified candidate flora species following the methods described in *Threatened Biodiversity Survey and Assessment Guidelines for Developments and Activities – Working Draft* (DEC 2004) and the *NSW Guide to Surveying for Threatened Plants* (OEH 2016). Wide transects were used to search and record any candidate species as the visibility of the site was high.

Figure 5-3 shows survey transects as tracks and BAM plot locations.

Figure 5-3: Proposal survey effort – Plot location and search tracks



STAGE 2 BAM: IMPACT TO BIODIVERSITY VALUES

6 Matters of National Environmental Significance (MNES)

6.1 Threatened species

The EPBC Protected Matters Report was generated with a one kilometre buffer around the proposed subject site.

There are ten MNES listed threatened species, seven listed migratory and 13 listed marine species with potential to occur within one kilometre of the development site (Table 6-1, Appendix D).

Table 6-1: MNES summary

MNES	Result	Comment
World Heritage Properties	None	
National Heritage Places	None	
Wetlands of International Importance	3	All are located more than 500 kilometres upstream from the development site
Great Barrier Marine Park	None	
Commonwealth Marine Area	None	
Listed Threatened Ecological Communities	1	Community does not occur in the development site
Listed Threatened Species	10	Four were not identified by NSW searches
Listed Migratory Species	7	Birds that will not be affected by the proposal
Commonwealth Land	None	
Commonwealth Heritage Places	None	
Listed Marine Species	13	Birds that will not be affected by the proposal
Whales and other Cetaceans	None	
Critical Habitats	None	
Australian Marine Parks	None	
Commonwealth Reserves Terrestrial	None	
State and Territory Reserves	None	
Forest Regional Agreements	None	
Invasive Species	14	
Nationally Important Wetlands	None	
Key Ecological Features (Marine)	None	

Four species are highlighted in the MNES report were not identified by searches under NSW legislation and the BAMC generated list of threatened species. These include;

- two birds – Curlew Sandpipe and Palins-wanderer
- one mammal – Corben's Long-eared Bat
- one plant – *Austrostipa metatoris*

Ten species of Commonwealth listed fauna or flora have been recorded within 10 kilometres from the development site (Table 6-2 and Figure 6-1). One Commonwealth listed threatened species has been recorded within 1500 metres of the development site.

Table 6-2: Commonwealth listed flora and fauna within 10 kilometres. Green highlight indicates species previously recorded within 1500m on BioNet.

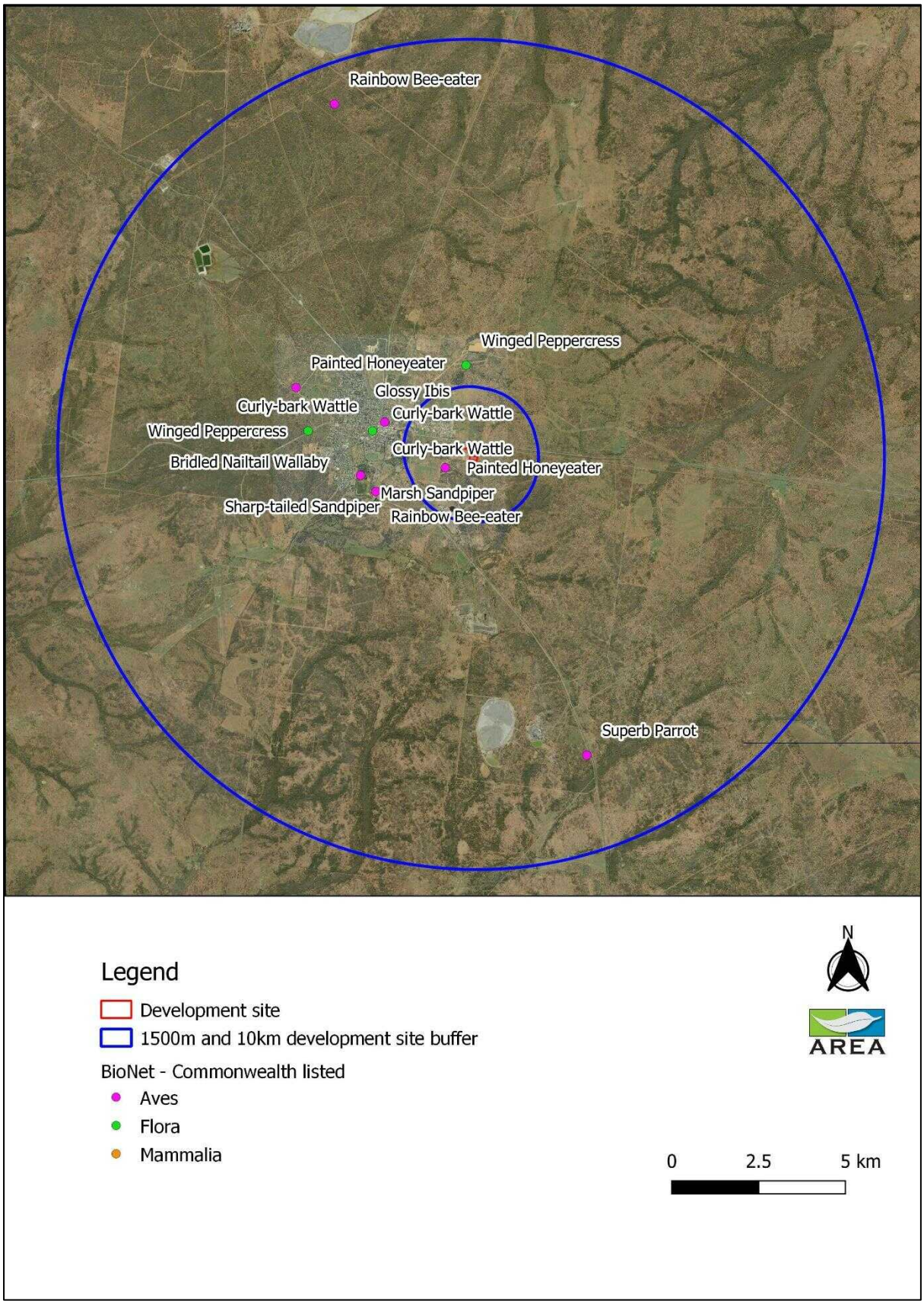
Class Name	Scientific Name	Common Name	NSW Status	Comm Status
Aves	*Plegadis falcinellus*	Glossy Ibis	P	C
Aves	*Tringa nebularia*	Common Greenshank	P	C J K
Aves	*Tringa stagnatilis*	Marsh Sandpiper	P	C J K
Aves	*Calidris acuminata*	Sharp-tailed Sandpiper	P	C J K (China, Korea and Japan bilateral agreements)
Mammalia	*Onychogalea fraenata*	Bridled Nailtail Wallaby	Extinct, P	E
Flora	*Lepidium monoplocoides*	Winged Peppercress	E	E
Aves	*Merops ornatus*	Rainbow Bee-eater	P	J
Flora	*Acacia curranii*	Curly-bark Wattle	V	V
Aves	*Grantiella picta*	Painted Honeyeater	V P	V
Aves	*Polytelis swainsonii*	Superb Parrot	V P	V

CE=Critically Endangered, E = Endangered, V= vulnerable, P = Protected, C = China bilateral agreement, J = Japan bilateral agreement, K = Korea bilateral agreement.

6.2 Migratory species

Seven migratory species listed under the EPBC Act may potentially occur within the development site. (EPBC Act Protected Matters Report). None of these are known to occur within 10 kilometres of the development site.

Figure 6-1: Commonwealth listed species within 10 kilometres of the development site



7 Minimise impacts

7.1 Demonstration of efforts to avoid and minimise impact on biodiversity values

The proponent has demonstrated the following efforts to avoid and minimise impact on biodiversity:

- The proponent has positioned the proposal adjacent to existing infrastructure and in an area of historic disturbance
- While the proposal seeks approval to remove native vegetation from the site, impact will be minimised wherever feasible, such as within the irrigation areas.

Refer to mitigation measures in Section 8.

7.2 Assessment of direct and indirect impacts unable to be avoided at the development site

7.2.1 Removal of native vegetation (residual impact)

The residual impact to native vegetation is described in Table 7-1.

Table 7-1: Residual impact to native vegetation.

Zone	Formation	Class	Plant Community Type (PCT) Name	Type of impact
1	Semi-arid Woodlands (Shrubby sub-formation)	Western Peneplain Woodlands	Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	Removal of 3.15 hectares of native vegetation

7.2.2 Loss of tree hollows and woody debris (sheltering and breeding habitat) and other fauna habitat

No hollow bearing tress and no coarse woody debris will be removed by this proposal. These habitat features are not present in the development site due to previous clearing and other disturbance/ use of the site.

Other habitat is provided by the sparse shrubs which may provide food or shelter resources for fauna; noting the site is degraded, vegetation is sparse and species richness is low.

7.2.3 Loss of dams (breeding and foraging habitat for wetland dependent species)

No dams or other waterways will be removed by the proposal,

7.2.4 Removal of threatened plants

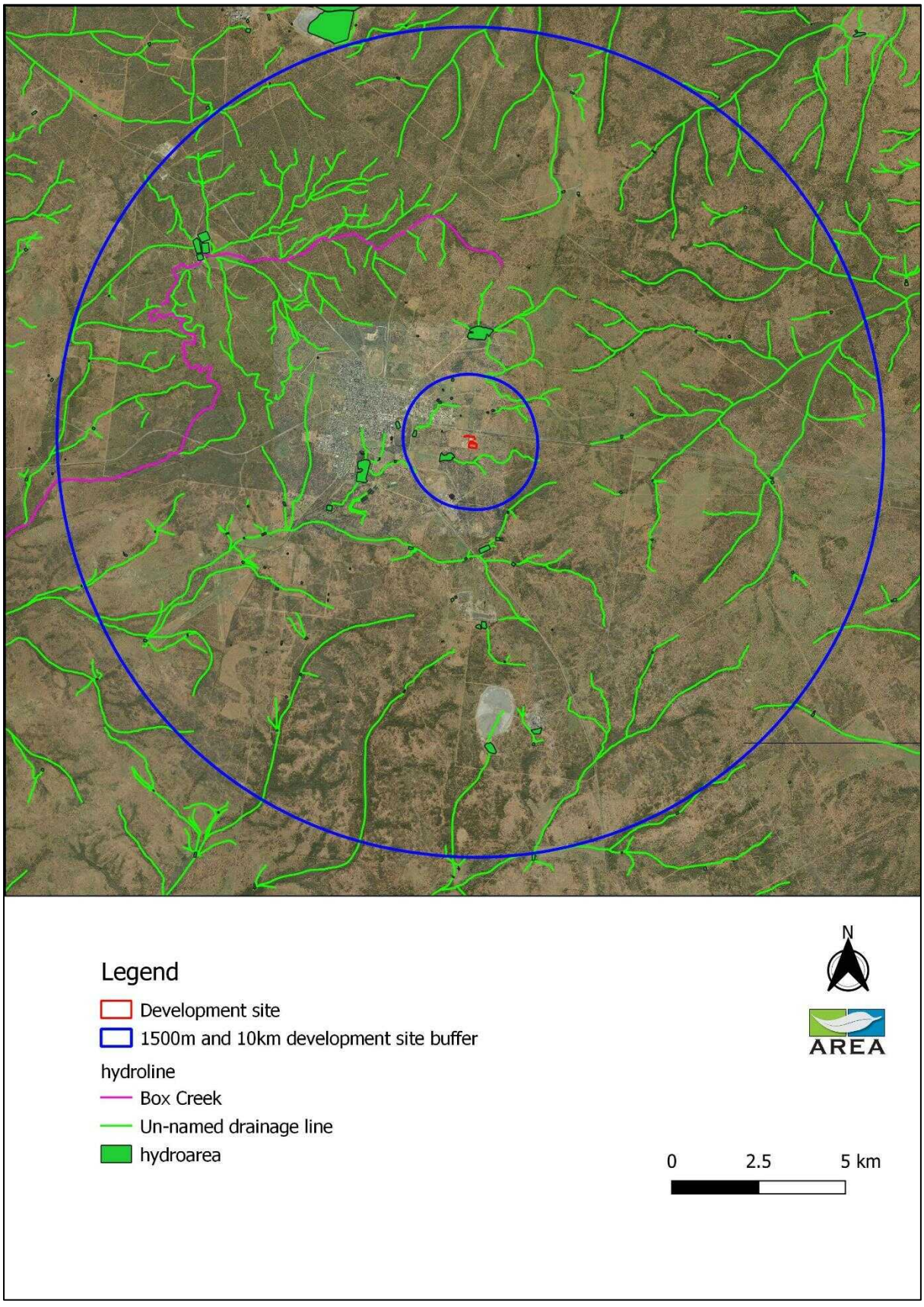
No threatened plants will be removed as part of this proposal.

7.3 Assessment of indirect impacts

7.3.1 Aquatic impacts

There are no mapped drainage lines in the development site. 1st and 2nd order drainage lines occur within 1500 metres of the development site; however, these will not be impacted by the proposal if mitigation measures are observed.

Figure 7-1: Waterways mapped within ten kilometres



7.3.2 Groundwater dependent ecosystems

The desktop review identified no groundwater dependent ecosystems on the development site, or data for the area does not exist. The proposal is not expected to impact or change groundwater flows.

7.3.3 Changes to hydrology

The proposal will result in negligible changes surface drainage. Impact mitigation includes monitoring and mitigation of surface water runoff and sediment and erosion control.

The proposal includes irrigation of treated water onto areas identified in this report. This activity will increase surface moisture but is unlikely to be of enough volume to change sub-surface hydrology.

All vegetation is unlikely to be removed in the areas for irrigation, meaning vegetation will be present to take-up the irrigated water and to hold the soil together wherever vegetation occurs.

7.3.4 Fragmentation of identified biodiversity links and habitat corridors

Existing habitat will not be fragmented as similar woodland vegetation surrounds the development site both within Lot 991 DP1029946 and adjacent properties.

7.3.5 Edge effects on adjacent native vegetation and habitat

Edge effects may move as the development on the Lot increases however is unlikely to increase as a result of this proposal.

7.3.6 Injury and mortality of fauna

Clearing vegetation may result in fauna injury and /or mortality however operation of the proposed activity is unlikely to impact fauna species given the minimal vegetation present on the site and the absence of hollow bearing trees and coarse woody debris.

All other fauna would have a chance to evade vegetation clearing and would likely seek refuge in adjacent habitat.

7.3.7 Weeds of national significance

One weeds of national significance, African Box Thorn, *Lycium ferocissimum*, was recorded in the BAM plots.

Other weeds recorded in the BAM plots of otherwise observed on the site include:

- Blue Heliotrope
- Thorn Apple

7.3.8 Invasion and spread of pests

Animal pests may use the development site, most likely are cats and foxes. Predation by feral cats and foxes is listed a Key Threatening Process under both the EPBC Act and the BC Act. Pests are managed through the existing Biodiversity Management Plan for the property.

7.3.9 Invasion and spread of pathogens and disease

In NSW, there are infectious pathogens with potential to impact on biodiversity. Any activities involving the movement of soil and equipment over large areas are a potential risk for spread and infection. Three pathogens are considered a negligible risk to the development site due to the low rainfall of the area. The proposal will not increase the

prevalence or likelihood of these pathogens. These are listed as key threatening processes under the EPBC Act and/or BC Act including:

- Dieback caused by Phytophthora (EPBC Act and BC Act).
- Infection of frogs by amphibian chytrid fungus causing the disease chytridiomycosis (EPBC Act and BC Act).
- Infection by Psittacine Circoviral (beak and feather) (EPBC Act and BC Act).

There is a low to negligible likelihood for the potential risk of pathogens on the development site during construction given its location and dry climate and they have not been detected on site. A Pathogen Management Plan is not needed.

Phytophthora (Phytophthora cinnamomi)
Phytophthora is soil-borne fungus causing tree death (dieback). It attacks the roots of a wide range of native plant species. Spores can be dispersed over relatively large distances by surface and sub-surface water flows. Infected soil/root material may be dispersed by vehicles (e.g. earth moving equipment).

Infection by Psittacine Circoviral (beak and feather)
Psittacine Circoviral (beak and feather) Disease (PCD) affects parrots and their allies (psittacines) and is often fatal. No other faunal species or groups are known to be susceptible to PCD (Murdoch University 1997). It is caused by a relatively simple virus that infects and kills the cells of the feather and beak, as well as cells of the immune system, leaving birds vulnerable to bacterial and other infections (Murdoch University 1997). The distribution of the disease and the factors involved in its spread are not well understood. The virus multiplies in the liver and can be transmitted orally or in faeces or feathers.

Chytrid fungus (Batrachocytrium dendrobatidis)
Chytrid fungus is a fatal infectious disease affecting amphibians worldwide. It is a water-borne fungus that may be spread because of handling frogs or through cross contamination of water bodies by vehicles and workers.

7.3.10 Noise, light, dust and vibration

During the construction of the proposal, dust and noise are likely to increase with the movement of construction machinery. Construction will occur during business hours and the resulting noise disturbance will be minimal. Dust will need to be managed to reduce dust leaving the site with potential to impact sensitive receivers in Cobar.

During operation of the proposal, light and noise may increase as a result of increased accommodation facilities and associated people.

7.3.11 Cumulative impact

Lot 991 DP21029946 is on the outskirts of Cobar, NSW and industrial complexes are the nearest other urban development.

This proposal will increase the movement of people, and established buildings in this urban - rural interface.

The site has been previously cleared and stripped of other habitat features. This proposal will increase the removal of native vegetation, however the cumulative impact of this will be minor given the history of the site, the surrounding rural land and the development already existing on the site.

7.4 Matters of National Environmental Significance (EPBC Act)

This chapter presents species identified by the Matters of National Environmental Significance.

7.4.1 Listed Threatened Species

Table 7-2: Threatened species identified in the MNES report

Common Name	Scientific Name	Commonwealth Status
Curlew Sandpiper	*Calidris ferruginea*	Critically Endangered
Painted Honeyeater	*Grantiella picta*	Vulnerable
Malleefowl	*Leipoa ocellate*	Vulnerable
Plains-wanderer	*Pedionomus torquatus*	Critically Endangered
Superb Parrot	*Polytelis swainsonii*	Vulnerable
Australian Painted-snipe	*Rostratula australis*	Endangered
Corben's Long-eared Bat	*Nyctophilus corbeni*	Vulnerable
Koala	*Phascolarctos cinereus*	Vulnerable
	Austrostipa metatoris	Vulnerable
Winged Peppercress	*Lepidium monoplocoides*	Endangered

7.5 Serious and Irreversible Impacts (SAII)

The BAMC Credit Summary Report (Appendix C) provides a column indicating Candidate SAIIs.

No SAII candidates are highlighted in the BAMC.

7.6 Impact summary

This section summarises all anticipated impacts requiring assessment under the BAM and other impacts not covered in BAM (refer Table 7-10). A summary of proposed mitigation is also included to demonstrate how impacts intend to be mitigated, with further details on mitigation provided in Chapter 8.

Table 7-3: Summary of impacts and proposed mitigation

Impact	Biodiversity values	Nature of impact Direct / indirect	Extent of impact Site based / local / regional / state / national	Duration Short or long term / pre, during or post construction	Relevant key threatening process	Proposed mitigation (refer detail in Chapter 8)	Requires offset?
Removal of native vegetation	Removal of 3.15ha	Direct	Site based	Long term	• Clearing of native vegetation (BC Act)	• Retain in other areas around facility.	No. VI is 5.8
Removal of threatened fauna species habitat and habitat features	No hollow bearing trees and dead standing trees occur in the development site.	Direct	Site based	Long term	• Clearing of native vegetation (BC Act) • Land clearance (EPBC Act)	• No significant modification to landscaping is required for the remainder of the site.	No
Application of treated water	Application rate will be maintained at a level such that biodiversity values will not be reduced, and sediment, erosion and runoff will not occur.	Direct	Site based	Long term	• Impact to native vegetation • Sediment and erosion	• Monitor application and impact.	No. Impact to native vegetation in the development site
Removal of threatened plants	None	N/A	N/A	N/A	N/A	N/A	No
Aquatic impacts	None	N/A	N/A	N/A	N/A	N/A	No
Groundwater dependent ecosystems	None	N/A	N/A	N/A	N/A	N/A	No
Changes to hydrology	None	N/A	N/A	N/A	N/A	N/A	No
Fragmentation of identified biodiversity links and habitat corridors	None	N/A	N/A	N/A	N/A	N/A	No
Edge effects on adjacent native vegetation and habitat	None	N/A	N/A	N/A	N/A	N/A	No

Impact	Biodiversity values	Nature of impact Direct / indirect	Extent of impact Site based / local / regional / state / national	Duration Short or long term / pre, during or post construction	Relevant key threatening process	Proposed mitigation (refer detail in Chapter 8)	Requires offset?
Injury and mortality of fauna	Fauna that can use the degraded vegetation	Direct / Indirect	Local	Short term / pre, during or post construction	N/A	• Pre-clearing and clearing process to minimise impacts to fauna	No
Invasion and spread of weeds	Disturbed soils	Indirect	Site	Short term / pre, during or post construction	• Invasion of native plant communities by exotic perennial grasses (BC Act)	• Weed control ongoing as part of standard operations.	No
Invasion and spread of pests	PCTs and native fauna	Indirect	Site	Long term	• Competition and grazing by the feral European rabbit (*Oryctolagus cuniculus*) (BC Act) • Predation and hybridisation of feral dogs (*Canis lupus familiaris*) (BC Act) • Predation by the European red fox (*Vulpes vulpes*) (BC Act) • Predation by the feral cat (*Felis catus*) (BC Act) • Predation by Plague Minnow or Mosquito Fish (*Gambusia holbrooki*) (BC Act) • Predation, habitat • degradation, competition and disease transmission by feral pigs (*Sus scrofa*) (BC Act)	• Pest control during operation already implemented • Vegetation monitoring program	No
Invasion and spread of pathogens and disease	None	N/A	N/A	N/A	N/A	N/A	No
Noise, light, dust and vibration	PCTs and native fauna and sensitive receivers	Direct/ indirect	Site	Short term / during spreading of manure from farm machinery	N/A	• Operation during daylight hours only • Mitigate dust during ground disturbance activity	No

8 Mitigation measures

Mitigation measures are required to further avoid and minimise impacts to biodiversity. These measures have been designed to address the potential negligible impacts identified in Chapter 7 being:

- Loss of vegetation and habitat for threatened species.
- Potential fauna mortality during construction.
- Edge effects and weed invasion.

A list of recommended mitigation measures is summarised in **Table 8-1**. These are designed to provide guidance on recommended measures to further avoid and mitigate impact to biodiversity.

Table 8-1: Recommended mitigation measures

Item	Timing	Recommended mitigation measures
Site personnel induction	Pre-construction	Ensure all construction staff working on the proposal are inducted on: • Site environmental procedures (i.e. vegetation management, sediment and erosion control, protective fencing, noxious weeds, hygiene protocols, ethical procedures for handling fauna displaced on the site). • What to do in case of environmental emergency (chemical spills, fire, injured fauna). • Key contacts in case of environmental emergency.
Site planning	Pre-construction	• Locate temporary infrastructure (set down areas, access tracks etc.) in cleared areas away from vegetation to minimise vegetation removal and indirect effects.
Identification of clearing limits	Pre-construction	• Accurately and clearly mark out the limits of clearing (where appropriate) and the vegetation to be retained outside of the construction footprint and / or used for post landscaping. • Regular inspections should be undertaken to ensure all retained vegetation/fauna habitat is clearly marked and that fencing is in place, where appropriate. • Only clear each stage of the proposal as required so that vegetation will be retained in the buffer area until future stages commence.
Protection of fauna during clearing of vegetation	Pre-construction and during clearing works	• Ensure all construction staff are aware of local wildlife carers and these carers are contacted in the event any fauna species are injured during clearing for or construction of this proposal.
Management of erosion and sediment control	Pre-and during construction	• Provide sediment and erosion controls to manage exposed soil surfaces and stockpiles to prevent sediment discharge off the development site. • Clearly identify stockpile and storage locations and provide erosion and sediment controls around stockpiles.
Weed management	Pre-and during construction	• Ensure that any machinery arriving on site be inspected for any foreign soil or plant matter/weed material and be washed down before entering the site. • Weeds should be controlled within the work area according to the requirements of the *Biosecurity Act 2016* • Any noxious weeds which are identified as part of the proposal must be disposed of appropriately.
Surface water management	Operation	• Monitoring of irrigation should occur routinely and as an ongoing concern to ensure the water does not run off the development site or does not cause movement of sediment or erosion as it moves across the surface.
Dust and noise management	Construction	• Construct during business hours • Mitigate dust production as necessary – with watercart, other suppressant or cease work
Monitor and review	All stages	• A review of mitigation measures (including a checklist) should be developed to ensure that all measures proposed have been undertaken.

9 Biodiversity offsets

9.1 BAMC offsetting requirement

As the proposal seeks approval under Part 4 of the NSW EPA Act the need for offsetting has been considered.

An assessment using the BAM and culminating in Biodiversity Assessment Report is triggered because:

- Area threshold is triggered: minimum lot size is 1000+ hectares – the impact is greater than two hectares.

The BAMC has been used to determine the offsetting requirements for the proposal. BAMC outputs area provided in Appendix C. For this assessment, the future vegetation integrity scores are zero.

No offsetting is triggered by this proposal for ecosystem or species credits.

Table 9-1: Current vegetation integrity scores

Zone	Area (ha)	Composition condition score	Structure condition score	Function condition score	Vegetation integrity (VI) score
1	3.15	6.9	13.9	2	5.8

Table 9-2: Ecosystem credit summary from BAMC

Zone	Matter requiring offsetting	Number of credits
1	Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	0

10 Conclusions and recommendations

10.1 Conclusions

The Biodiversity Assessment Report (BDAR) has been prepared to meet the requirements of the Biodiversity Assessment Method (OEH 2017) and the *NSW Biodiversity Conservation Act 2016.* This has involved an assessment of the landscape values on the site and surrounding assessment area, the vegetation communities present and their condition relative to benchmark scores, and the known or potential presence of threatened flora or fauna species.

The development site was selected to avoid impacts to remnant vegetation as much as possible. Despite this, the proposal would result in some loss of remnant vegetation and impacts are described in the BDAR along with measures to further avoid and mitigate potential impacts to biodiversity.

The development site has been previously cleared and has previously been the site of industrial operations.

The native vegetation was mapped as PCT103 in all areas of native vegetation in the development site. Removal of this vegetation does not trigger offsetting for ecosystem credits or species credit species.

It is recommended to implement mitigation measures recommended on Table 8-1.

11 References

Australia, B. (2016). *Find a Bird (online)*. Retrieved from Birdlife Australia: http://www.birdsaustralia.com.au/search/birds

Benson, J. (2009). New South Wales Vegetation Classification and Assessment, NSWVCA batabase. Sydney: NSW DEC.

Bueau of Meteorology. (2018). *Climate Statistics for Australian Locations: Walgett Council Depot*. Retrieved from http://www.bom.gov.au/climate/averages/tables/cw_052026.shtml

Cropper, S. (1993). *Management of endangered plants.* Melbourne: CSIRO Publications.

Department of Environment and Conservation. (2004). *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities.* Sydney, NSW: NSW Government Department of Environment and Conservation.

Department of Environment and Conservation. (2009). *Biobanking Assessment Methodology and Credict Calculator Operation Manual .* Sydney: Department of Environment and Climate Change.

Department of Environment and Climate Change. (2009). *Threatened species survey and assessment guidelines: field survey methods for fauna – Amphibians.* Sydney: Department of Environment and Climate Change.

Department of Environment and Conservation . (2004). *Threatened Species Survey and Assessment: Guidelines for developments and activities (working draft).* Hurstville: Department of Environment and Conservation .

Department of Environment, Water, Heritage and the Arts . (2010b). *Survey Guidelines for Australia's Threatened Birds.* Commonwealth Government: Department of Environment, Water, Heritage and the Arts .

Department of Environment, Water, Heritage and the Arts . (2011a). *Survey Guidelines for Australia's Threatened Reptiles.* Commonwealth Government: Department of Environment, Water, Heritage and the Arts .

Department of Environment, Water, Heritage and the Arts . (2011b). *Survey Guidelines for Australia's Threatened Mammals.* Commonwealth Government: Department of Environment, Water, Heritage and the Arts .

Department of Environment, Water, Heritage and the Arts. (2010a). *Survey Guidelines for Australia's Threatened Bats.* Commonwealth Government: Department of Environment, Water, Heritage and the Arts.

Department of Environment, Water, Heritage and the Arts. (2010c). *Survey Guidelines for Australia's Threatened Frogs.* Commonwealth Government: Department of Environment, Water, Heritage and the Arts.

Department of Primary Industries . (2017b). *Listed threatened species, populations and ecological communities (online).* Retrieved from Listed threatened species, populations and ecological communities (online).: http://www.dpi.nsw.gov.au/fisheries/species-protection/conservation/what-current#Key- threatening-processes

Department of Primary Industries. (2017). *Threatened & protected species - records viewer (online)*. Retrieved from Threatened & protected species - records viewer (online): http://www.dpi.nsw.gov.au/fisheries/species-protection/records/viewer

Department of the Environment. (2013). *Commonwealth Significant Impact guidelines.* ACT: Commonwealth Government.

Department of the Environment. (2013). Matters of National Environmental Significance -

Significant impact guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999. Department of the Environment. Canberra, ACT: Commonwealth of Australia . Retrieved April 2015, from http://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf

Department of the Environment. (2017). *Protected Matters Search Tool (online)*. Retrieved from http://www.environment.gov.au/topics/about-us/legislation/environment-protection-and-biodiversity-

Department of the Environment. (2017). *Species Profiles and Threats Database (SPRAT), (online)*. Retrieved from Species Profiles and Threats Database (SPRAT), (online): http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Environment Australia 2000. Revision of the Interim Biogeographic Regionalisation of Australia (IBRA) and Development of Version 5.0 - Summary Report. Department of Environment and Heritage, Canberra.

Environment Australia. (2001). A Directory of Important Wetlands in Australia, Third Edition. ACT: Environment Australia.

Fairfull, S. a. (2003). Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings. Cronulla: NSW Fisheries.

Kuginis L., Byrne G., Serov P, Williams J.P. (2012). Risk assessment guidelines for groundwater dependent ecosystems, Volume 3 – Identification of high probability groundwater dependent ecosystems on the coastal plains of NSW and their ecological value. Sydney: NSW Department of Primary Industries, Office of Water.

NSW Department of Primary Industries. (2017a). *NSW WeedWise (online)*. Retrieved from NSW WeedWise (online): http://weeds.dpi.nsw.gov.au/

Office of Environment and Heritage. (2014). *Framework for Biodiversity Assessment.* Sydney: NSW Government.

Office of Environment and Heritage. (2014). *Major Projects Offsets Policy.* Sydney: NSW Government.

Office of Environment and Heritage. (2017). *Atlas of NSW Wildlife (online)*. Retrieved from Atlas of NSW Wildlife (online): http://www.environment.nsw.gov.au/asmslightprofileapp/account/login?ReturnUrl=%2fAtlasApp%2fDefault.aspx

Office of Environment and Heritage. (2017). *Threatened Species Profile Database (online)*. Retrieved from Threatened Species Profile Database (online): http://www.environment.nsw.gov.au/asmslightprofileapp/account/login?ForceLogin=1

Office of Environment and Heritage. (2017). *Vegetation Information System (online)*. Retrieved from Vegetation Information System (online): http://www.environment.nsw.gov.au/NSWVCA20PRapp/LoginPR.aspx

Resource and Conservation Division. (2001). Comprehensive Regional Assessment Floristic Types Information (CRAFTI).

Royal Botanic Gardens and Domain Trust, Sydney (online). (2017). *PlantNET (The NSW Plant Information Network System)*. Retrieved from PlantNET (The NSW Plant Information Network System): http://plantnet.rbgsyd.nsw.gov.au

Thackway, R. a. (1995). An interim biogeographic regionalisation for Australia: a framework for setting priorities in the National Reserves System Cooperative Program, Version 4.0. ACT: Australian Nature Conservation Agency.

Appendix A: BAM Fieldwork data sheets

BAM Plot – Field Survey Form

Site Sheet no: 1

Survey Name	Plot Identifier	Recorders
Cobar miningcamp	1	Dave Sturman Mark Sturman

Date	Zone	Datum	IBRA region	Photo #	Zone ID
22/01/22	55	GDA	Cobar Peneplain Woodlands		

Easting	Northing	Plot Dimensions	Orientation of midline from the 0 m point.
391801	6513959	20 x 20 in 20 x 50 (e.g. 20 x 20 in 20 x 50)	100 Magnetic °

Likely Vegetation Class	Western peneplain Woodlands	Confidence: H M L
Plant Community Type	103	EEC: Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	0
	Shrubs	8
	Grasses etc.	0
	Forbs	1
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0
	Shrubs	6.24
	Grasses etc.	0
	Forbs	0.01
	Ferns	0
	Other	0
High Threat Weed cover %		0.01

This table may be completed after entering data into available tools. It is not required while in the field.

BAM Attribute (20 x 50 m plot) dbh	Euc*	Non Euc	Stem Classes and Hollows: Hollows†
80 + cm			
50 – 79 cm			
30 – 49 cm			Hollows 20cm+
20 – 29 cm			
10 – 19 cm	tick	1 ✓	
5 – 9 cm	tick	tick	
< 5 cm	tick	tick	This size class records tree regeneration
Length of logs (m) (≥10 cm diameter, >50 cm in length)			total

Record **living** eucalypt* (Euc*) and **living native** non-eucalypt (Non Euc) stems separately

Data needed is presence only (tick) unless a 'large tree' for that veg class.

* includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*

† For **hollows** count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

Each size class is noted as present by the **living tree stems** only. Depending on the Vegetation Class, DBH values and counts may be needed for a size class. For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate if it is required by the large tree category for that vegetation class.

Hollows at least 20cm across are recorded for the purposes of habitat of some threatened species.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	9 7 5 2 1	90 90 88 96 98	0 1 0 0 0	0 1 5 1 1
Average of the 5 subplots	4.8	92.4	0.2	1.6

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code
Clearing (inc. logging)		
Cultivation (inc. pasture)		
Soil erosion		
Firewood / CWD removal		
Grazing (identify native/stock)		
Fire damage		
Storm damage		

Free Text Section for brief site description

Plot representative of PCT + zone.

Leaf Litter and end point GPS		
ID	Easting	Northing
End point	391857	6513959

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 27/01/20	Cobar Mining Camp	1	OS, MS

ID	BAM Code	GF Code	Full species name mandatory, or a unique means of identifying separate taxa within a survey. Data from here will be used to assign growth form counts and covers.	N, E or HTE	Cover	Abund	stratum	voucher	Height (m)
1	SG	S	Eremophila starkii Turpentine	N	5	8			1.5
2	SG	S	Apophyllum anomalum Warrior Bush	N	1	3			0.7
3			Medicago sp. Barrell medic	E	1	500			10cm
4	SG	S	Solanum ferocissimum Spiny potato bush	N	0.a	5			
5	FG	F	Boerhavia dominii Tarvine	N	0.01	2			
6	SG	C	Sclerolaena birchii Galbarr	N	0.01	1			
7	SG	C	Maireana microphylla Blue bush	N	0.01	<10			
8	SG	C	Sclerolaena diacantha Grey Copperburr	N	0.1	>50			
9	SG	C	Maireana Wingles tosmeweed	N	0.1	>50			
10			Xanthium spinosum Bathurst burr	HTE	0.01	1			
11	SG	C	Sclerolaena divaricata Pale poverty bush	N	0.01	>10			
12			Sisymbrium sp	E	0.01	1			
13			~~Xanthium spinosum~~ Pattersons curse	E	0.1	>10			
14			Echium plantagineum						
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

	Abund	Cover
TG	0	0
SG	8	6.24
GG	0	0
FG	1	0.01
EG	0	0
other	0	0

6.2 ✱

GF Code: see Growth Form definitions in BAM Appendix 1. Identify top 3 dominants in the veg zone. **N:** native, **E:** exotic, **HTE:** high threat exotic.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Print more copies of this sheet to allow for higher species counts at a plot. All species at a plot need to be recorded.

BAM Plot – Field Survey Form

Site Sheet no: 2

Survey Name	Plot Identifier	Recorders
Cobar Mining Camp	2	Dave Sturrock Mark Thum

Date	Zone	Datum	IBRA region	Photo #	Zone ID
22/01/20	55	GDA	Canbelago Downs		

Easting	Northing	Plot Dimensions (e.g. 20 x 20 in 20 x 50)	Orientation of midline from the 0 m point.
391732	6513905	20 x 20 in 20 x 50	22 Magnetic °

		Confidence: H M L
Likely Vegetation Class	Western peneplain Woodlands	H M L
Plant Community Type	103 — EEC:	H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	0
	Shrubs	7
	Grasses etc.	0
	Forbs	2
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0
	Shrubs	3.13
	Grasses etc.	0
	Forbs	0.02
	Ferns	0
	Other	0
High Threat Weed cover %		0.05

This table may be completed after entering data into available tools, it is not required while in the field.

BAM Attribute (20 x 50 m plot) dbh	Euc*	Non Euc	Stem Classes and Hollows: Hollows†
80 + cm			/
50 – 79 cm			
30 – 49 cm			Hollows 20cm+
20 – 29 cm			/
10 – 19 cm	tick	1 tick	
5 – 9 cm	tick	tick	
< 5 cm	tick	tick	This size class records tree regeneration
Length of logs (m) (≥10 cm diameter, >50 cm in length)	Tally spaces		total 2

Record **living** eucalypt* (Euc*) and **living native** non-eucalypt (Non Euc) stems separately

Data needed is presence only (tick) unless a 'large tree' for that veg class.

* includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*

† For **hollows** count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

Each size class is noted as present by the **living tree stems** only. Depending on the Vegetation Class, DBH values and counts may be needed for a size class. For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate if it is required by the large tree category for that vegetation class.

Hollows at least 20cm across are recorded for the purposes of habitat of some threatened species.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	1: 20, 35, 3, 3	96, 77, 65, 95, 94	0, 0, 0, 0, 0	3, 3, 0, 1, 2
Average of the 5 subplots	12.4	85.4	0	1.8

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code
Clearing (inc. logging)		
Cultivation (inc. pasture)		
Soil erosion		
Firewood / CWD removal		
Grazing (identify native/stock)		
Fire damage		
Storm damage		

Free Text Section for brief site description

Plot representative of site

Leaf Litter and end point GPS

ID	Easting	Northing
End point	391749	6513957

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date: 02/01/20	Cobar Mungunyan	2	DS. MS

ID	BAM Code	GF Code	Full species name mandatory, or a unique means of identifying separate taxa within a survey. Data from here will be used to assign growth form counts and covers.	N, E or HTE	Cover	Abund	stratum	voucher	Height (m)
1	SG	S	Dodonea viscosa Hop bush	N	1	3			1.2
2	SG	S	Eramophilla sturtii Turpentine	N	1	5			1.2
3			Medicago sp Barrel med	E	1	<100			<10cm
4	SG	C	Maireana enchylaena Bottle tissue	N	0.01	1			
5			Echium plantagineum Patersons curse	E	0.2	<10			
6			Heliotropium amplexicaule Blue heliotrope	HTE	0.05	4			
7	FG	F	Sida corrugata Corrugated sida	N	0.01	10			
8	SG	C	Sclerolaena birchii Galvanised burr	N	0.01	2			
9	SG	C	Maireana microphylla Blue cotton bush	N	0.1	1			
10	SG	C	Maireana sp	N	1	>100			
11	EG	F	Solanum esuriale	N	0.01	1			
12			~~Sida corrugata~~		~~0.01~~	~~10~~			
13	SG	C	Maireana declavens Black cotton bush	N	0.01	1			
14									
15									
16									
17									
18			Abund | Cover						
19		TG	0 | 0						
20		SG	7 | 3.13						
21		EG	0 | 0						
22		FG	2 | 0.02						
23		EG	0 | 0						
24		de	0 | 0						
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35			2.01						
36									
37									
38									
39									
40									

GF Code: see Growth Form definitions in BAM Appendix 1. Identify top 3 dominants in the veg zone. **N:** native, **E:** exotic, **HTE:** high threat exotic.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Print more copies of this sheet to allow for higher species counts at a plot. All species at a plot need to be recorded.

Appendix B: BAMC Reports

BAM Credit Summary Report

Proposal Details

Assessment Id
00016708//20/00016709

Proposal Name
Cobar Mining Camp

BAM data last updated *
26/11/2019

Assessor Name

Report Created
28/01/2020

BAM Data version *
22

Assessor Number

BAM Case Status
Finalised

Date Finalised
28/01/2020

Assessment Revision
0

Assessment Type
Part 4 Developments (General)

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	Vegetation integrity loss / gain	Area (ha)	Constant	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAII	Ecosystem credits

Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion								
1	103_Mod_Good_Low	5.8	3.2	0.25	High Sensitivity to Potential Gain	1.75		0
							Subtotal	**0**
							Total	**0**

Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAII	Species credits

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id 00016708//20/00016709	Proposal Name Cobar Mining Camp	BAM data last updated * 26/11/2019
Assessor Name	Assessor Number	BAM Data version * 22
Proponent Names ROVEST HOLDINGS PTY LTD	Report Created 28/01/2020	BAM Case Status Finalised
Assessment Revision 0	Assessment Type Part 4 Developments (General)	Date Finalised 28/01/2020

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Nil

Nil

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

BAM Biodiversity Credit Report (Like for like)

Predicted Threatened Species Not On Site

Name
Grantiella picta / Painted Honeyeater
Haliaeetus leucogaster / White-bellied Sea-Eagle

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	Not a TEC	3.2	0.00

103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion

Like-for-like credit retirement options

Class	Trading group	HBT	IBRA region
Western Peneplain Woodlands This includes PCT's: 103, 135, 145	Western Peneplain Woodlands - ≥ 50% - < 70% cleared group (including Tier 6 or higher).	No	Canbelego Downs, Barnato Downs, Bogan-Macquarie, Boorindal Plains and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

Species Credit Summary

No Species Credit Data

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00016708//20/00016709

Assessment name
Cobar Mining Camp

BAM data last updated *
26/11/2019

Assessor Name

Report Created
28/01/2020

BAM Data version *
22

Assessor Number

Assessment Type
Part 4 Developments (General)

BAM Case Status
Finalised

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Assessment Revision
0

Date Finalised
28/01/2020

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	103_Mod_Good_Low	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	Mod_Good_Low	3.15	2	

BAM Candidate Species Report

Proposal Details

Assessment Id 00016708//20/00016709	Proposal Name Cobar Mining Camp	BAM data last updated * 26/11/2019
Assessor Name	Report Created 28/01/2020	BAM Data version * 22
Assessor Number	Assessment Type Part 4 Developments (General)	BAM Case Status Finalised
	Assessment Revision 0	Date Finalised 28/01/2020

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months
Hamirostra melanosternon Black-breasted Buzzard	No (surveyed) *Survey months are outside of the months specified in Bionet.	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Sida rohlenae Shrub Sida	No (surveyed) *Survey months are outside of the months specified in Bionet.	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Hieraaetus morphnoides Little Eagle	No (surveyed) *Survey months are outside of the months specified in Bionet.	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Haliaeetus leucogaster White-bellied Sea-Eagle	No (surveyed) *Survey months are outside of the months specified in Bionet.	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

List of Species Not On Site

Name
Burhinus grallarius Bush Stone-curlew
Lophochroa leadbeateri Major Mitchell's Cockatoo

Geophaps scripta scripta Squatter Pigeon (southern subspecies)
Ninox connivens Barking Owl
Phascolarctos cinereus Koala
Polytelis swainsonii Superb Parrot
Setirostris eleryi Bristle-faced Free-tailed Bat
Acacia curranii Curly-bark Wattle
Antaresia stimsoni Stimson's Python
Calyptorhynchus lathami Glossy Black-Cockatoo
Diuris tricolor Pine Donkey Orchid
Pterostylis cobarensis Greenhood Orchid

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00016708//20/00016709	Cobar Mining Camp	26/11/2019
Assessor Name	**Report Created**	**BAM Data version ***
	28/01/2020	22
Assessor Number	**Assessment Type**	**BAM Case Status**
	Part 4 Developments (General)	Finalised
	Assessment Revision	**Date Finalised**
	0	28/01/2020

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Barking Owl	Ninox connivens	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Black-breasted Buzzard	Hamirostra melanosternon	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Corben's Long-eared Bat	Nyctophilus corbeni	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Diamond Firetail	Stagonopleura guttata	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Gilbert's Whistler	Pachycephala inornata	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Glossy Black-Cockatoo	Calyptorhynchus lathami	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Grey Falcon	Falco hypoleucos	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion

Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Koala	Phascolarctos cinereus	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Kultarr	Antechinomys laniger	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Little Eagle	Hieraaetus morphnoides	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Little Pied Bat	Chalinolobus picatus	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Major Mitchell's Cockatoo	Lophochroa leadbeateri	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Pied Honeyeater	Certhionyx variegatus	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Speckled Warbler	Chthonicola sagittata	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Spotted Harrier	Circus assimilis	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Superb Parrot	Polytelis swainsonii	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Varied Sittella	Daphoenositta chrysoptera	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion

Threatened species not within the area of these PCT's

Common Name	Scientific Name	Vegetation Types(s)
Painted Honeyeater	Grantiella picta	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
White-bellied Sea-Eagle	Haliaeetus leucogaster	103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id
00016708//20/00016709

Proposal Name
Cobar Mining Camp

BAM data last updated *
26/11/2019

Assessor Name

Assessor Number

BAM Data version *
22

Proponent Name(s)
ROVEST HOLDINGS PTY LTD

Report Created
28/01/2020

BAM Case Status
Finalised

Assessment Revision
0

Assessment Type
Part 4 Developments (General)

Date Finalised
28/01/2020

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Nil

Nil

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

BAM Biodiversity Credit Report (Variations)

Predicted Threatened Species Not On Site

Name
Grantiella picta / Painted Honeyeater
Haliaeetus leucogaster / White-bellied Sea-Eagle

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	Not a TEC	3.2	0.00

103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion

Like-for-like credit retirement options

Class	Trading group	HBT	IBRA region
Western Peneplain Woodlands This includes PCT's: 103, 135, 145	Western Peneplain Woodlands - ≥ 50% - < 70% cleared group (including Tier 6 or higher).	No	Canbelego Downs,Barnato Downs, Bogan-Macquarie, Boorindal Plains and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Variation options

Formation	Trading group	HBT	IBRA region

	Semi-arid Woodlands (Shrubby sub-formation)	Tier 6 or higher	No	IBRA Region: Cobar Peneplain, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

Appendix C: NSW and Commonwealth database search results

BC Act

Scientific Name	Common Name	Type of Species	NSW Status
Crinia sloanei	Sloane's Froglet	Animal>Amphibians	Vulnerable
Chalinolobus picatus	Little Pied Bat	Animal>Bats	Vulnerable
Mormopterus eleryi	Bristle-faced free-tailed bat, Hairy-nosed Freetail Bat	Animal>Bats	Endangered
Nyctophilus corbeni	Corben's Long-eared Bat	Animal>Bats	Vulnerable
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Animal>Bats	Vulnerable
Amytornis striatus	Striated Grasswren	Animal>Birds	Vulnerable
Anseranas semipalmata	Magpie Goose	Animal>Birds	Vulnerable
Ardeotis australis	Australian Bustard	Animal>Birds	Endangered
Artamus cyanopterus cyanopterus	Dusky Woodswallow	Animal>Birds	Vulnerable
Botaurus poiciloptilus	Australasian Bittern	Animal>Birds	Endangered
Burhinus grallarius	Bush Stone-curlew	Animal>Birds	Endangered
Calyptorhynchus lathami	Glossy Black-Cockatoo	Animal>Birds	Vulnerable
Certhionyx variegatus	Pied Honeyeater	Animal>Birds	Vulnerable
Chthonicola sagittata	Speckled Warbler	Animal>Birds	Vulnerable
Cinclosoma castanotum	Chestnut Quail-thrush	Animal>Birds	Vulnerable
Circus assimilis	Spotted Harrier	Animal>Birds	Vulnerable
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Animal>Birds	Vulnerable
Daphoenositta chrysoptera	Varied Sittella	Animal>Birds	Vulnerable
Epthianura albifrons	White-fronted Chat	Animal>Birds	Vulnerable
Falco hypoleucos	Grey Falcon	Animal>Birds	Endangered
Falco subniger	Black Falcon	Animal>Birds	Vulnerable
Geophaps scripta scripta	Squatter Pigeon (southern subspecies)	Animal>Birds	Critically Endangered
Grantiella picta	Painted Honeyeater	Animal>Birds	Vulnerable
Grus rubicunda	Brolga	Animal>Birds	Vulnerable
Haliaeetus leucogaster	White-bellied Sea-Eagle	Animal>Birds	Vulnerable
Hamirostra melanosternon	Black-breasted Buzzard	Animal>Birds	Vulnerable
Hieraaetus morphnoides	Little Eagle	Animal>Birds	Vulnerable
Leipoa ocellata	Malleefowl	Animal>Birds	Endangered
Limosa limosa	Black-tailed Godwit	Animal>Birds	Vulnerable
Lophochroa leadbeateri	Major Mitchell's Cockatoo	Animal>Birds	Vulnerable
Lophoictinia isura	Square-tailed Kite	Animal>Birds	Vulnerable
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Animal>Birds	Vulnerable
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Animal>Birds	Vulnerable
Neophema pulchella	Turquoise Parrot	Animal>Birds	Vulnerable
Ninox connivens	Barking Owl	Animal>Birds	Vulnerable
Oxyura australis	Blue-billed Duck	Animal>Birds	Vulnerable
Pachycephala inornata	Gilbert's Whistler	Animal>Birds	Vulnerable
Polytelis swainsonii	Superb Parrot	Animal>Birds	Vulnerable

Scientific Name	Common Name	Type of Species	NSW Status
Pomatostomus halli	Hall's Babbler	Animal>Birds	Vulnerable
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Animal>Birds	Vulnerable
Pyrrholaemus brunneus	Redthroat	Animal>Birds	Vulnerable
Rostratula australis	Australian Painted Snipe	Animal>Birds	Endangered
Stagonopleura guttata	Diamond Firetail	Animal>Birds	Vulnerable
Stictonetta naevosa	Freckled Duck	Animal>Birds	Vulnerable
Turnix maculosus	Red-backed Button-quail	Animal>Birds	Vulnerable
Tyto novaehollandiae	Masked Owl	Animal>Birds	Vulnerable
Antechinomys laniger	Kultarr	Animal>Marsupials	Endangered
Dasyurus maculatus	Spotted-tailed Quoll	Animal>Marsupials	Vulnerable
Onychogalea fraenata	Bridled Nailtail Wallaby	Animal>Marsupials	Presumed Extinct
Petrogale penicillata	Brush-tailed Rock-wallaby	Animal>Marsupials	Endangered
Phascolarctos cinereus	Koala	Animal>Marsupials	Vulnerable
Sminthopsis macroura	Stripe-faced Dunnart	Animal>Marsupials	Vulnerable
Antaresia stimsoni	Stimson's Python	Animal>Reptiles	Vulnerable
Artesian Springs Ecological Community in the Great Artesian Basin	Artesian Springs Ecological Community in the Great Artesian Basin	Community>Threatened Ecological Communities	Critically Endangered Ecological Community
Coolibah-Black Box Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain and Mulga Lands Bioregions	Coolibah-Black Box Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain and Mulga Lands Bioregions	Community>Threatened Ecological Communities	Endangered Ecological Community
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Community>Threatened Ecological Communities	Endangered Ecological Community
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	Community>Threatened Ecological Communities	Endangered Ecological Community
Atriplex infrequens		Plant>Herbs and Forbs	Vulnerable
Lepidium monoplocoides	Winged Peppercress	Plant>Herbs and Forbs	Endangered
Oldenlandia galioides		Plant>Herbs and Forbs	Endangered
Sida rohlenae	Shrub Sida	Plant>Herbs and Forbs	Endangered
Swainsona murrayana	Slender Darling Pea	Plant>Herbs and Forbs	Vulnerable
Diuris tricolor	Pine Donkey Orchid	Plant>Orchids	Vulnerable
Pterostylis cobarensis	Greenhood Orchid	Plant>Orchids	Vulnerable
Acacia curranii	Curly-bark Wattle	Plant>Shrubs	Vulnerable
Bertya opponens	Coolabah Bertya	Plant>Shrubs	Vulnerable
Acacia petraea	Lancewood	Plant>Trees	Endangered
Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species	Threat>Disease	Key Threatening Process
Infection of frogs by amphibian chytrid causing the	Infection of frogs by amphibian chytrid causing the	Threat>Disease	Key Threatening

Scientific Name	Common Name	Type of Species	NSW Status
disease chytridiomycosis	disease chytridiomycosis		Process
Infection of native plants by Phytophthora cinnamomi	Infection of native plants by Phytophthora cinnamomi	Threat>Disease	Key Threatening Process
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	Alteration to the natural flow regime of rivers, streams, floodplains & wetlands.	Threat>Habitat Loss/Change	Key Threatening Process
Anthropogenic Climate Change	Human-caused	Threat>Habitat Loss/Change	Key Threatening Process
Bushrock removal	Bushrock Removal	Threat>Habitat Loss/Change	Key Threatening Process
Clearing of native vegetation	Clearing of native vegetation	Threat>Habitat Loss/Change	Key Threatening Process
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	Ecological consequences of high frequency fires	Threat>Habitat Loss/Change	Key Threatening Process
Loss of Hollow-bearing Trees	Loss of Hollow-bearing Trees	Threat>Habitat Loss/Change	Key Threatening Process
Loss or degradation (or both) of sites used for hill-topping by butterflies	Loss and/or degradation of sites used for hill-topping by butterflies	Threat>Habitat Loss/Change	Key Threatening Process
Removal of dead wood and dead trees	Removal of dead wood and dead trees	Threat>Habitat Loss/Change	Key Threatening Process
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Threat>Other Threat	Key Threatening Process

EPBC – Matters of National Environmental Significance