Biodiversity Impact Assessment for Environmental Authority (EA0001613) Amendment #1

Surat Gas Project (SGP) South:

Wyalla, Kogan Creek, Tetris 1 & Boundary Rd Part 1

Prepared for:
Arrow Pty Ltd

Document Information

DOCUMENT	Biodiversity Impact Assessment for Environmental Authority (EA0001613) Amendment #1. Surat Gas Project (SGP) South – Wyalla, Kogan Creek, Tetris 1 and Boundary Road Part 1
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REVIEWED BY	Principal Environmental Scientist - Attexo

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REVISION	DATE	DETAILS	AUTHORISATION	
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1.0 Introduction

Attexo Pty Ltd (Attexo) has been engaged by Arrow Pty Ltd (Arrow) to undertake an assessment of biodiversity impacts associated with the development of the Surat Gas Project (SGP) South to inform an application to amend the approved Environmental Authority (EA0001613) (SGP South EA) under the *Environmental Protection Act 1994* (Qld) (EP Act). Specifically, amendments are being sought to authorise impacts associated with the Wyalla, Kogan Creek, Tetris 1 and Boundary Road Part 1 gas area development projects (the Project) of the SGP South gas field.

For the purposes of this assessment, values and impacts have been reported using a Study area around the development footprint (refer **Figure 1.1**) which is based on a 500 m buffer of proposed infrastructure.

The Project involves the construction of wells and associated supporting activities and additional infrastructure and incidental activities on the following Petroleum Lease (PL) tenements:

- PL493; and
- PL1040.

The SGP South EA also covers PL1039, PL1041, PL1042, PL1043, PL253 and PL185. However, no works are proposed on these tenements with respect to this EA amendment application.

Attexo has been engaged to undertake the following to inform an EA amendment application under the EP Act:

- assess the ecological values of the Study area;
- calculate anticipated impacts on these values associated with the updated Project design;
- confirm the extent to which these impacts are already approved or trigger an amendment to the current EA; and
- where the impacts are not already approved under the current EA, assess and report on the likely significance of those impacts.

This report has been prepared specifically to support the amendment application documentation for the SGP South EA.

1.1 Project description

The SGP South Project will deliver natural gas to the QGC Bellevue Delivery Point and comprises a number of petroleum leases located to the north-east and south-west of the townships of Kogan and Tara, Western Downs Region, Queensland. The Project Development comprises a series of well pads, gas and water gathering pipelines, and associated infrastructure and petroleum activities required to transfer coal seam gas and produced water on PL493 and PL1040. Due to the proposed infrastructure areas occurring in two distinct areas separated by approximately 50 km, these study areas are also referred to as:

- the 'northern portion of Study area' refers to the northern area of proposed infrastructure on PL493.
- the 'southern portion of Study area' refers to the proposed infrastructure on PL1040 .

The proposed works in PL493 (northern portion of the Study area) are mostly associated with the Wyalla gas area development project, but also include two well pads in the Kogan Creek project area and various road upgrade scopes.

The proposed works in PL1040 (southern portion of the Study area) are associated with the Tetris 1 and Boundary Road Part 1 gas area development projects and Lynwood to Tipton Road upgrade works.

1.2 Approach to assessment of impacts

1.2.1 Likelihood of occurrence assessment

A Likelihood of Occurrence Assessment (LOO) as part of this report is the basis for determining if State listed threatened species are considered in this biodiversity impact assessment. Only those individual species considered 'known to occur' or 'likely to occur' (refer to **Section 2.1.2.1** for specific definitions of these terms) are included in the description of ecological values for the Project (**Section 3.0**), and only these species that have mapped habitat in the Project footprint (refer to the discussion of Study area versus Project footprint below) are assessed in accordance with the Significant Residual Impact (SRI) Guidelines (DEHP, 2014).

Species habitat is broadly mapped based on the presence of ecological values considered to be required to support the species. However, relevant historical records need to exist within 10 km of the Study area before an impact assessment for the species is included in this BIA report. This means that there can be mapped species habitat in the Study area, but the absence of relevant historical records indicates that these habitat values maybe outside of the geographical range of the species and / or populations of the species including dispersing and migrating individuals aren't considered likely to use the habitat values in the Study area.

For example, whilst potentially suitable habitat for the Common Dead Adder (*Acanthophis antarcticus*) may be mapped within the Study area (and Project footprint), the absence of nearby reliable records indicates that this species may not utilise these habitat values. This species has therefore been listed as 'Potential to occur' in the LOO and has not been assessed further in this report or assessed against the SRI guidelines.

Additionally, in every desktop assessment there are typically several species that have very broad or poorly defined habitat preferences and it is simply not possible to rule out their presence in a given locality entirely. As such, it is standard practice to adopt the precautionary principle and assign these species to a 'Potential to occur' category (or similar).

For this Project, species assigned to this category may be considered unlikely to occur in the Study area but cannot be ruled out entirely. For example, habitat in the Study area broadly fits the habitat preferences of Squatter Pigeon but it has never been recorded despite consolidated survey efforts and a marked increase in ecological research across the broader SGP since 2011 by Arrow and other coal seam gas proponents; and the species being highly mobile, conspicuous, known to frequent cleared tracks and roadsides where they are easily visible and the subject of significant public interest, particularly among a large body of professional and amateur ornithologists.

For other species, the Study area may contain potential suitable habitat values. However, the lack of nearby reliable records (i.e. >10 km away from the Study area) indicates that the species cannot be considered to be known or likely to occur, and based on the absence of nearby records, it is unlikely that these habitat values are actively utilised by these species. Therefore, conservatively, the presence of these species cannot be ruled out as not occurring in the Study area and are identified as potentially occurring.

Fauna species nominated as having a 'Potential to occur' within the Study area include:

- Squatter Pigeon
- Corben's Long-eared Bat
- Greater Glider (southern and central)
- Yellow-bellied Glider (south-eastern)
- Common Death Adder
- Dunmall's Snake.

Given the high-level uncertainty around whether these species do, in fact, occur in a Study area it is generally accepted practice to exclude them from further assessment. Significant residual impacts are then undertaken for known and likely species where the degree of impact can be predicted with greater confidence, with any impacts to habitat for these species included in the PEMs table.

1.2.2 Study area versus Project footprint

It is important to note that the LOO undertaken was conducted across the 'Study area' (defined as the proposed infrastructure layout or Project footprint plus a 500 metre buffer), while PEMs values are calculated based on the area of *impacted habitat within the Project footprint*.

This approach is standard for linear infrastructure projects where impact areas are often quite narrow and/or fragmented and there are no firm boundaries that would prevent mobile fauna species entering into the Project footprint even where it does not contain significant habitat resources for a particular species. As such, it is possible for a species to be 'known to occur' or 'likely to occur' within the Study area but not have habitat mapped within the Project footprint.

Whilst relevant environmental values were assessed at both the 'Project footprint' and 'Study area' scale, the Impact Assessment (presented in **Section 4.0**), only summarises impacts within the Project footprint.

1.3 Scope of this report

The scope of this Biodiversity Impact Assessment (BIA) report includes the following matters relevant to the EA amendment:

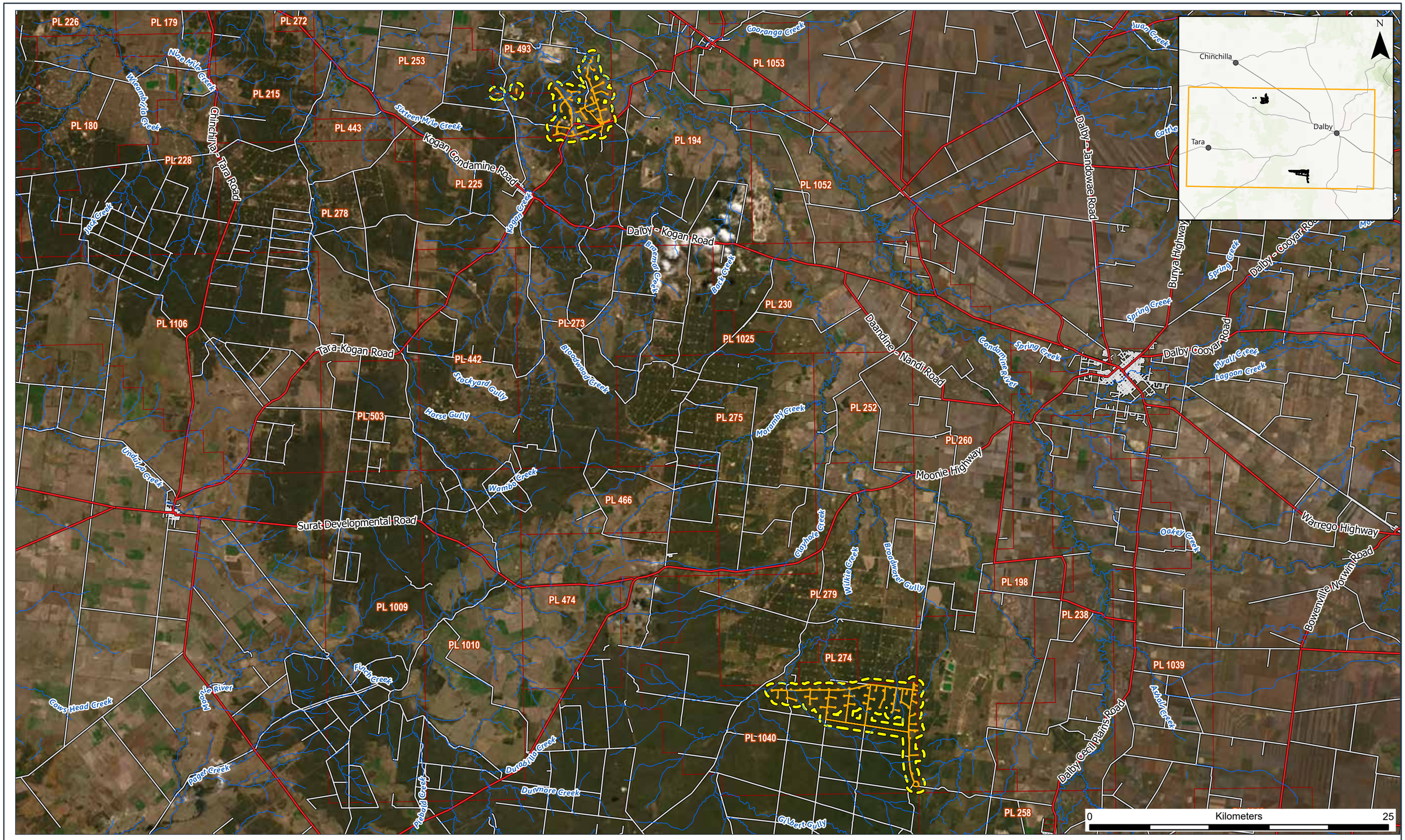
- a review of desktop biodiversity information and ecological field surveys of the Study area to identify any new (i.e. previously unassessed) values relevant to the amendment application (e.g. records and habitat values for species such as Kogan Waxflower that were not listed at the time of the original EA application and approval);
- the calculation of predicted impacts on Environmentally Sensitive Areas (ESAs) protected under the EP Act (as defined under the Environmental Protection Regulation 2019 (Qld) (EP Regulation) and the SGP South EA);
- the calculation of predicted impacts on Prescribed Environmental Matters (PEMs) protected under the *Environmental Offsets Act 2014* (Qld) (EO Act) (as defined under the Environmental Offsets Regulation 2014 (Qld) (EO Regulation));
- an analysis of the extent to which these predicted impacts are already approved under the existing SGP South EA and identification of any further impacts that would trigger the requirement to amend it; and
- an impact assessment for all trigger values, including previously unassessed biodiversity values identified through the desktop assessment.

1.3.1 Limitations

In undertaking the analysis, Attexo has relied on spatial data and data extracts provided by Arrow on the 21 January 2025. Any subsequent amendments have not been incorporated into the assessment. For the purposes of this report, Attexo notes the following limitations:

- Project disturbances may be co-located with those for other gasfield infrastructure. Only the impacts (i.e. hectares) directly attributable to the Project footprint have been assessed in this report. Impacts related to other infrastructure are to be assessed separately under their respective approvals.

- survey effort data has been collated from a range of sources, with information on survey effort at individual spatial locations based on advice provided by Arrow Energy's ecology team.
- in undertaking the likelihood of occurrence assessment in **Section 2.1.2.1**, the species habitat mapping provided by Arrow has been used as 'suitable habitat' in determining the assessment categories for individual species.
- it is understood that all gathering RoWs and other linear corridors have a width of less than 40 m and are compliant with Condition (Biodiversity 5).
- it has been assumed that Arrow has undertaken reviews of the Aboriginal and Torres Strait Islander Cultural Heritage Database and Register and that cultural heritage values do not exist in the study area.
- this report relates to terrestrial biodiversity values only and does not include biodiversity values associated with groundwater (e.g. groundwater dependent ecosystems, stygofauna).



Project Footprint and Study Area (Page 1 of 3)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL Granted

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:300,000 | **DATE:** 29/01/2025 | **DWG No:** ARR-002_116[C] | **FIGURE 1.1**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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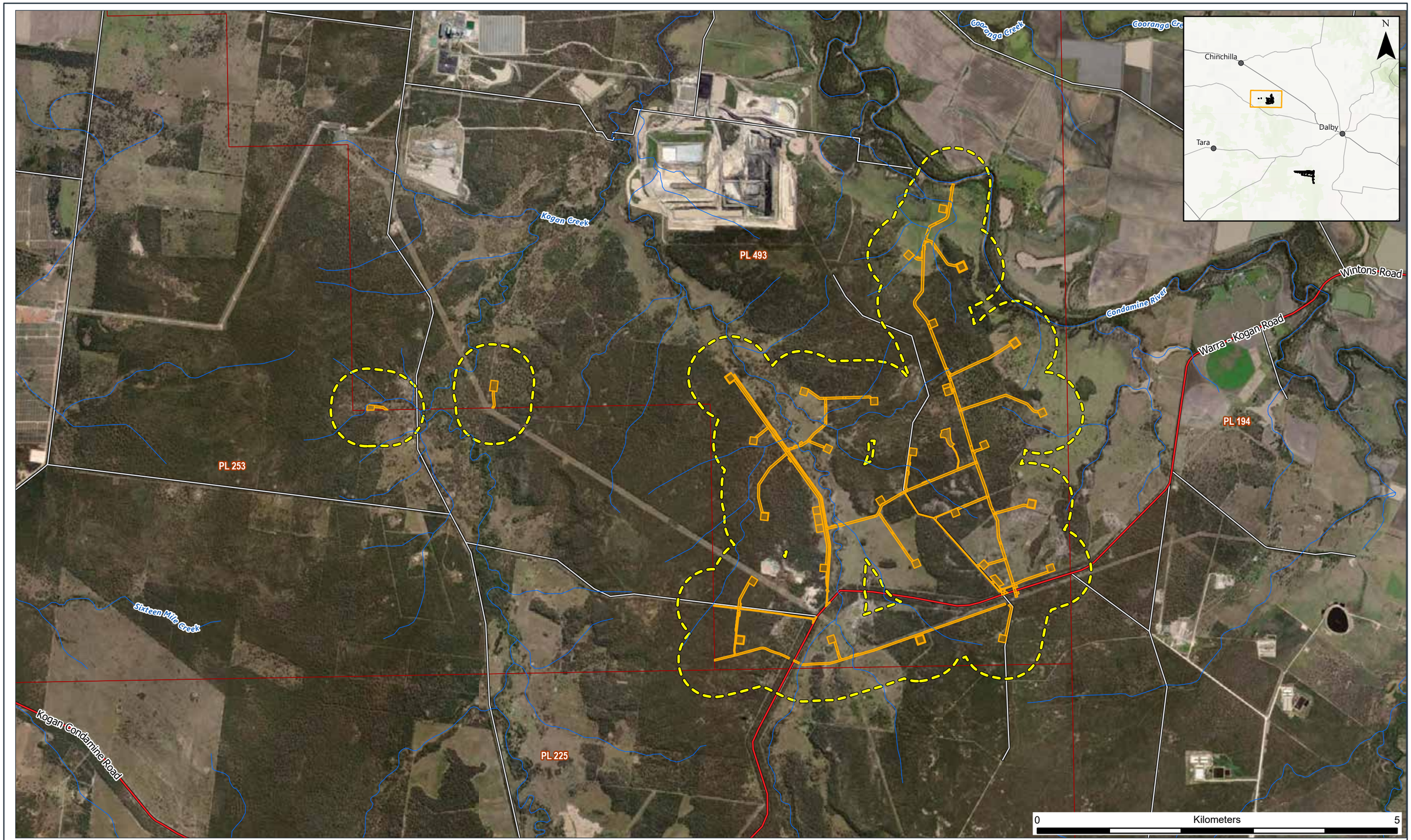

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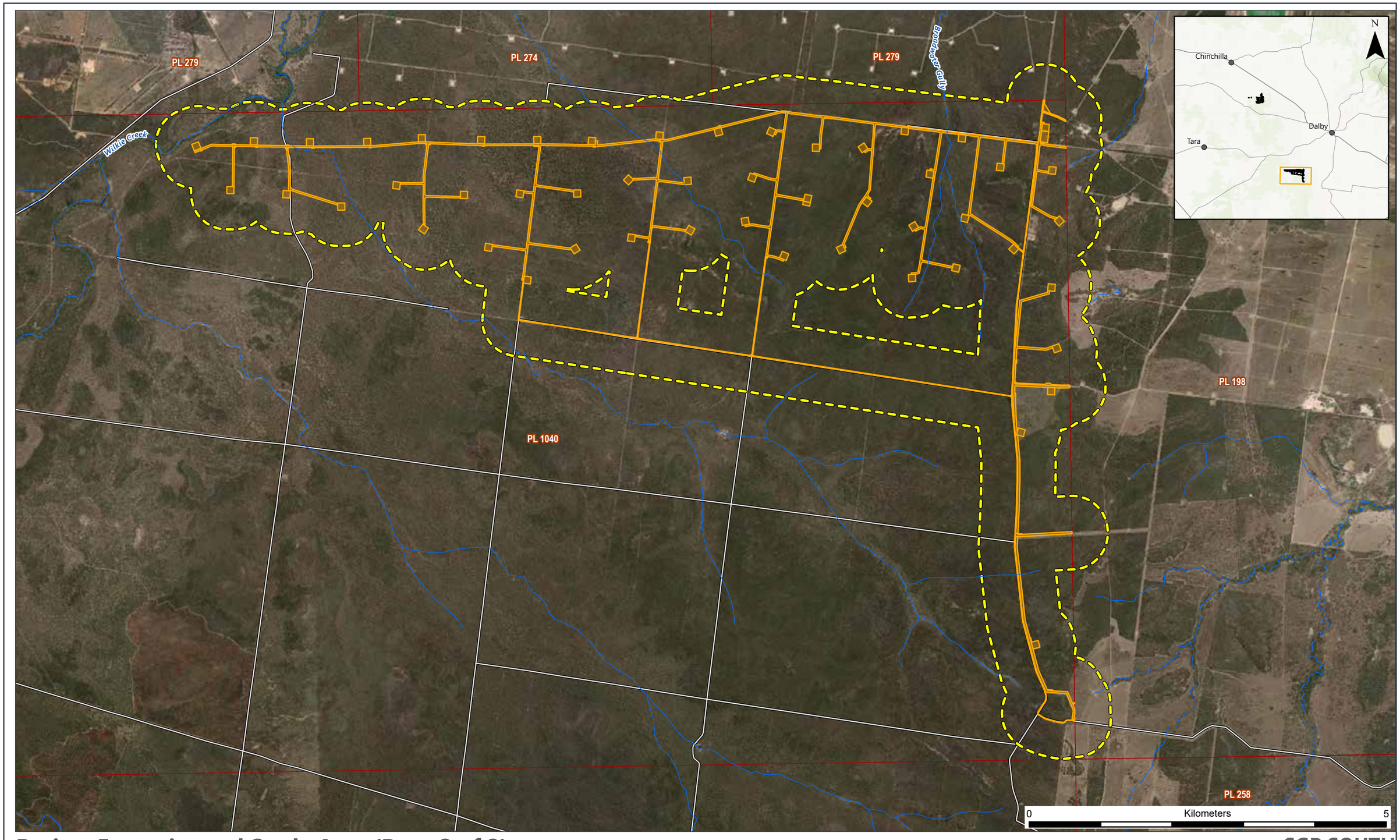

Project Footprint and Study Area (Page 3 of 3)

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1.4 Regulatory Framework

1.4.1 *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)

The Environmental Impact Statement (EIS) for the broader SGP was assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in 2013. Maximum disturbance limits to core habitat for Matters of National Environmental Significance (MNES) listed under the EPBC Act at the time of the approval are conditioned in Table 1 of the EPBC approval (EPBC 2010/5344) (included as **Appendix A**).

Disturbance to the habitat of MNES species and communities already approved under EPBC 2010/5344 have been considered in the assessment. There are also MNES that have been included in the assessment where a species that has been historically recorded in the Study area and listed as conservation-significant under both the EPBC Act and *Nature Conservation Act 1992* (Qld) (NC Act) subsequent to the original approval in 2013.

Specifically, the following MNES species have been included in the assessment:

- Diamond Firetail, *Stagonopleura guttata* – listed as 'vulnerable' in March 2023
- Glossy Black-cockatoo (south-eastern), *Calyptorhynchus lathami lathami* – listed as 'vulnerable' in August 2022
- Painted Honeyeater, *Grantiella picta* – listed as 'vulnerable' in July 2015
- White-throated Needletail (*Hirundapus caudacutus*) – listed as 'vulnerable' in July 2019;
- Koala, *Phascolarctos cinereus* – first listed in April 2012; upgraded to 'endangered' in February 2022
- Brigalow Woodland Snail, *Adclarkia cameroni* – listed as 'endangered' in December 2016

1.4.2 *Environmental Protection Act 1994* (Queensland)

The primary approval governing the operation of the SGP South Project at the State level is the Environmental Authority (EA0001613) (SGP South EA) issued under the EP Act (see **Appendix B**). The EA as currently in force was issued on the 28 June 2022 and authorises up to 715 gas production wells and up 535 km of gathering pipelines across PL1039, PL1040, PL1041, PL1042, PL1043, PL185 and PL493.

The existing EA was approved on the basis of a concept or 'reference' design, which has now been subject to further engineering design and the application of the avoidance principle in the mitigation hierarchy with additional ecology survey data. Arrow is seeking to amend the SGP South EA to reflect impacts associated with the current design and ensure that Arrow are not offsetting impacts to matters that have been avoided or reduced.

The total number of wells for the proposed gas areas in this BIA is 84 out of 715 planned wells currently authorised in *Schedule A, Table 1 – Authorised Petroleum Activities* in the SGP South EA, and out of a total of 370 wells authorised in this table under PL493 and PL1040 combined.

The primary conditions protecting the biodiversity values of the SGP South area are contained in the "Biodiversity conditions" schedule of the SGP South EA (Conditions "Biodiversity 1" to "Biodiversity 17"). A number of amendments are being sought to these conditions to update impacts associated with the development of the SGP South gas areas and associated infrastructure under this proposed amendment. Details of the proposed amendments are provided in **Section 5.0**.

1.4.2.1 Petroleum activities

The Study area defines three categories of petroleum activities which are used to restrict the kinds of activities that can be undertaken in ESAs and their protection zones. These are 'low impact petroleum activities' that involve limited ground disturbance, 'essential petroleum activities' and 'petroleum activities'.

A summary of the types of incidental activities proposed for the development of the Project and their corresponding definitions is provided in **Table 1.1**. Low impact petroleum activities have not been included in this table as they are currently authorised under the SGP South EA.

Table 1.1 Petroleum activities proposed for the SGP South Project

Infrastructure type	Essential petroleum activity	Petroleum activity
Well pads	✓	-
RoW (for gas and water gathering)	✓	-
Access roads and tracks	✓	-
Borrow pits	-	✓
Extra work areas	-	✓
Laydown areas	-	✓
Communication Towers	-	✓
Mobile Drilling Camps	-	✓

1.4.2.2 Conservation status of Regional Ecosystems

The Regional Ecosystem Description Database (REDD) lists Regional Ecosystem (RE) types by their biodiversity status (BD status) and the vegetation management class (VM class) of each. The BD status is based on an assessment of the condition of remnant vegetation in addition to the criteria used to determine the class under the *Vegetation Management Act 1999* (Qld) (VM Act). It is used for a range of planning and management applications including the determination of Environmentally Sensitive Areas (ESAs) that are used for the regulation of the mining and petroleum industry through provisions in the EP Act. The Brigalow Belt Bioregion REDD (Version 13.1) has been considered in this BIA. For the purposes of the current assessment:

- ESAs are based on the BD status of a given RE type, with 'endangered' Regional Ecosystems (REs) mapped as Category B ESAs and 'of concern' by BD status mapped as Category C ESAs; and
- Prescribed environmental matters (PEMs) are based on VM class.

1.4.2.3 Essential Habitat

Under the definitions in the SGP South EA, 'essential habitat' is a Category C ESA only where it is for an endangered or vulnerable species of wildlife, and only to the extent that it has been validated as 'essential habitat' by ground-truthing surveys in accordance with the *Vegetation Management Act 1999* (VM Act). For the purposes of this report, Queensland Government 'essential habitat' mapping has been adopted as the basis for the assessment of impacts to

essential habitat. DETSI revised definition of 'essential habitat' has not been adopted as it is currently not conditioned in the EA. Arrow will discuss with the department about how the new definition is applied retrospectively to existing EAs where the impact had previously been assessed and approved.

Similarly, essential habitat only constitutes a PEM where it is for an animal or plant that is listed as critically endangered, endangered, or vulnerable under the *Nature Conservation Act 1992* (NC Act) (see Schedule 2 of the EO Regulation). An area of essential habitat for a near threatened species only constitutes a PEM for the EO Act where it is being impacted by a development being assessed under the *Planning Act 2016* that triggers consideration of State Code 16 (Clearing of native vegetation) as set out in Schedule 2 of the EO Regulation. *Protecting biodiversity values, Table 1* of the SGP South EA contains references to 'essential regrowth habitat'. However, there is no definition of this included in the SGP South EA.

Essential Habitat impacts in relation to this EA amendment are discussed further in **Section 5.1**.

1.4.3 Environmental Offsets Act 2014

Under the Queensland Environmental Offsets Framework (implemented by the EO Act and associated legislation), an environmental offset is required where a significant residual impact occurs to a Matter of State Environmental Significance (MSES). MSES are prescribed in Schedule 2 of the EO Regulation and include:

- an area of habitat for an animal that is endangered, vulnerable or special least concern ('protected wildlife habitat');
- vegetation communities listed as 'endangered' or 'of concern' Regional Ecosystem types under the VM Act;
- essential habitat (as mapped by the Department of Environment, Science and Innovation (DESI));
- an area that is or is not shown as a high risk area on the flora survey trigger map that contains plants that are endangered or vulnerable wildlife;
- regulated vegetation that intersects with wetlands and watercourses;
- connectivity values;
- wetlands of high ecological significance;
- protected areas (including nature refuges);
- declared fish habitat areas and waterways providing for fish passage; and
- legally secured offset areas.

Within the EA decision process under the EP Act, significant residual impacts on these MSES are authorised via their inclusion under Condition Biodiversity 10 in *Protecting biodiversity values, Table 3 – Significant residual impacts to prescribed environmental matters* (refer **Section 5.2**).

1.4.4 Nature Conservation Act 1992

The NC Act provides for the gazettal of protected areas including nature refuges, prescribes classes of wildlife and sets out restrictions on the taking or harm to native wildlife without a valid permit. Threatened flora and fauna species have been assessed in terms of those with potential to occur in the Study area. Classes of wildlife recognised under the NC Act include:

- Extinct in the Wild;
- Critically endangered;

- Endangered;
- Vulnerable;
- Near Threatened;
- Special Least Concern.

It is noted that habitat for a near threatened species does not constitute an ESA, nor is it a PEM under the EO Act. The presence or potential presence of a near threatened species triggers requirements under the NC Act that are approved and managed separately to the EA. Therefore, the occurrence or potential occurrence of near threatened species or their habitat does not trigger any requirement to amend the Study area.

Similarly, habitat for a plant classed as Special Least Concern does not constitute a PEM or ESA however, habitat for a Special Least Concern animal is a PEM for the purposes of the EO Act. As such, the presence of Special Least Concern plants has been noted however, only Special Least Concern fauna species have been included in the PEMs table.

1.4.4.1 Protected Plants Framework

Under the Queensland Government's Protected Plants Framework (administered under the NC Act and Nature Conservation (Plants) Regulation 2020), where non-exempt clearing of protected plants in the wild is proposed within a high risk area, a proponent is required to complete a flora survey prior to any clearing. The main objective of the flora survey is to locate any extinct, extinct in the wild, critically endangered, endangered, vulnerable or near threatened plants within a clearing impact area. Pre-clearance surveys are typically undertaken within 12 months prior to construction to support an application for a clearing permit under the NC Act where required.

1.4.5 Vegetation Management Act 1999

Petroleum activities do not require permits under the VM Act as clearing is regulated through the EA process under the EP Act. Where appropriate, the VM Class of REs is referred to in the assessment. The VM class is used to define PEMs for the purposes of the EO Act.

Under the VM Act, vegetation communities, which are known in Queensland as REs, are assigned to one of three classes. These classes are known as the VM Class and are:

- Endangered RE – less than 10% of the pre-clearing extent of a particular community remains across a given bioregion; or 10-30% of the pre-clearing extent remains and the remnant area is less than 10,000 ha;
- Of concern RE – 10-30% of the pre-clearing extent of a particular community remains across a given bioregion; or more than 30% of the pre-clearing extent remains and the remnant area is less than 10,000 ha; and
- Least concern RE – more than 30% of the pre-clearing extent of a particular community remains across a given bioregion, and the remnant area is greater than 10,000 ha.

2.0 Methodology

The ecological values discussed in this BIA report were initially identified through a combination of desktop and field-based assessments undertaken as part of Terrestrial Ecological Surveys undertaken across the broader SGP (EcoSmart, 2017), off tenure Ecological Surveys (EcoSmart, 2019) and Arrow EFS surveys undertaken between 2011 and 2024. Several other ecological surveys have been undertaken across parts of the SGP to support various State and Commonwealth approvals, including field verification of proposed infrastructure locations undertaken by Arrow ecologists. These studies have provided Arrow with a comprehensive understanding of the ecological values and flora and fauna assemblages characteristic of vegetation communities and habitats in the Study area.

The following sections summarise the desktop and field-based information relevant to the Study area and the processes by which this information was collected.

2.1 Desktop ecological assessments

2.1.1 Description of general ecological values

Desktop assessments for the current assessment involved a review of Queensland Government mapping to identify the presence of landscape ecological values and MSES in the Study area. This included reviews of:

- MSES conservation areas (protected area estates; nature refuges, special wildlife reserves, declared fish habitat areas, legally secured offset areas designated precincts in strategic environmental areas, highly protected zones of Queensland marine parks);
- connectivity values (Queensland Statewide Biodiversity Corridors mapping);
- catchment and waterway values (Queensland major watercourse lines mapping, watercourse identification map, MSES – high ecological value waters);
- wetland values (MSES – high ecological significance wetlands mapping, wetland protection areas, declared high ecological vale (HEV) waters (watercourse and wetlands), regulated vegetation (defined watercourse);
- MSES regulated vegetation and habitat; and
- waterways providing fish passage.

2.1.2 Desktop flora and fauna assessments

A desktop assessment was undertaken in October 2024 to identify terrestrial flora and fauna values potentially relevant to the Study area. The intent of the desktop assessment was to identify ESAs and PEMs relevant to the Study area, including threatened and migratory species of conservation significance that have been listed since the current SGP South EA was approved (28 June 2022).

Desktop assessments for the current assessment involved a review of:

- The Department of Climate Change, the Environment, Energy and Water's (DCCEEW) Protected Matters Search Tool (PMST) based around the Study area (results included in **Appendix C**);
- DESI WildNet database to identify previously recorded flora and fauna species within the SGP South area plus a 50 km buffer. Search results from October 2024 (based around a single point search with an extended buffer zone are included in **Appendix C**;

- Queensland Government mapping products, including MSES, certified RE Mapping (Version 13) and Protected Plants Trigger Mapping;
- project-specific ground-truthed RE (GTRE) mapping undertaken by suitably qualified ecologists for Arrow and threatened flora records maintained in Arrow's GIS;
- project-specific survey reports, data and habitat mapping rules developed using results from terrestrial fauna surveys relevant to the Study area;
- recent work undertaken by EcoSmart Ecology (EcoSmart) (2023) to update and consolidate ecological data collected across the broader SGP, which included recent database searches within 50 km of the entire SGP area; and
- available published ecological information for threatened flora and fauna species where available.

2.1.2.1 Likelihood of occurrence assessment

A Likelihood of Occurrence Assessment was undertaken using the results of the desktop searches described above. This assessment refined the potentially occurring flora and fauna species based on suitable habitat availability, the proximity of known records and the species-specific habitat mapping rules develop by Arrow for the broader SGP Project and determined to be applicable to the Study area.

The following categories were applied in this assessment:

- **Known to Occur**: Suitable habitat has been mapped for this species and records have been found within the Study area (<10 years).
- **Likely to Occur**: Suitable habitat has been mapped for this species and historical records have been identified (<50 years) within 10 km of the Study area. Alternatively, suitable habitat has been mapped for this species and older historical records of this species (<50 years) have been observed within the Study area.
- **Possibly Occurring**: Suitable habitat has been mapped for this species and historical records have been identified (<50 years) within 50 km of the Study area.
- **Unlikely to Occur**: Suitable habitat has been mapped for this species, however the nearest historical record is >50 km away; OR No suitable habitat has been mapped for this species.

Additional considerations are given to species that are highly mobile and/or hard to verify from historical records alone. The locality of the Project in comparison to the known distribution of these individual species is also given consideration. The resulting Likelihood of Occurrence assessment has been provided in **Appendix D**. Flora and Fauna species identified as 'known to occur' and 'likely to occur' within the Study area have been considered further as part of this impact assessment.

2.2 Field-based assessments

Several ecological surveys have been conducted within the Study area and surrounds. A summary of relevant survey programs is provided in **Table 2.1**, with a more detailed breakdown of flora and fauna survey efforts provided in the following sections.

Data collected during ecological field survey (EFS) by Arrow ecologists is included at **Appendix E**.

Table 2.1 Summary of Ecological Surveys conducted across the Project

Survey	Survey Type	Timing	Undertaken by
Off-Tenement Terrestrial Ecology Survey Report	Flora and Fauna	December 2019	EcoSmart
Surat Gas Project – Terrestrial Ecology Report	Flora and Fauna	October 2016 March 2017	EcoSmart
Surat Ecological Studies	Flora and Fauna	2011-2024	Arrow
Supplementary EIS Surveys	Flora and Fauna	February 2013	3D Environmental, EcoSmart

2.2.1 Flora survey effort

Project-specific RE mapping and the assessment of terrestrial flora values is based on numerous field surveys undertaken across the broader SGP South area since the original EIS in 2013. GTRE mapping across the wider SGP South gas fields builds on mapping prepared for the EIS and refined by EcoSmart in 2017. Since then, this GTRE mapping has been systematically verified and updated based on field survey efforts that are part of Arrow's scouting and pre-clearance surveys to assist in the implementation of the mitigation hierarchy for the field development layout.

In total, 1322 vegetation assessments have been undertaken in the Study area in accordance with the *Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland* (Neldner, 2022), including:

- **Secondary Site Assessments**: Used for the primary classification and detailed descriptions of REs and vegetation communities. They incorporate the collection of the overall structural characteristics of a community and the composition of flora species within each of the structural layers.
- **Tertiary Site Assessments**: Like the secondary site assessments in their collection of structural characteristics and species composition within each structural layer, however these assessments only focus on the dominant species within each of these layers. Tertiary sites were also used in areas where seasonal conditions made it difficult to complete a full secondary site assessment.
- **Quaternary Site Assessments**: Used as the main source of data collection whilst traversing through the survey area, these surveys were undertaken at regular intervals to confirm the presence of already identified vegetation communities and to refine the mapping units of where these vegetation communities change. These assessments are rapid assessments when compared to the more comprehensive secondary and tertiary site assessments.
- **Opportunistic Flora Observations**: Opportunistic observations of flora species not previously noted or infrequently recorded were made during all survey efforts undertaken across the broader SGP. Opportunistic observations of threatened flora species recorded within the Study area or within adjacent and representative vegetation have also been included in this biodiversity impact assessment.

Flora survey sites were initially selected using aerial photograph analysis and State RE mapping but were also undertaken opportunistically whilst field teams were traversed through the broader SGP area. The following assessments have been undertaken within and surrounding the Study area and have been used to inform GTRE mapping for the Study area:

- 298 Secondary assessment sites;

- 3 Tertiary assessment sites; and
- 1021 Quaternary assessment sites.

Numerous generic observation sites were also used to refine the RE mapping within the Study area. The location of all survey sites is presented in **Figure 2.1.**

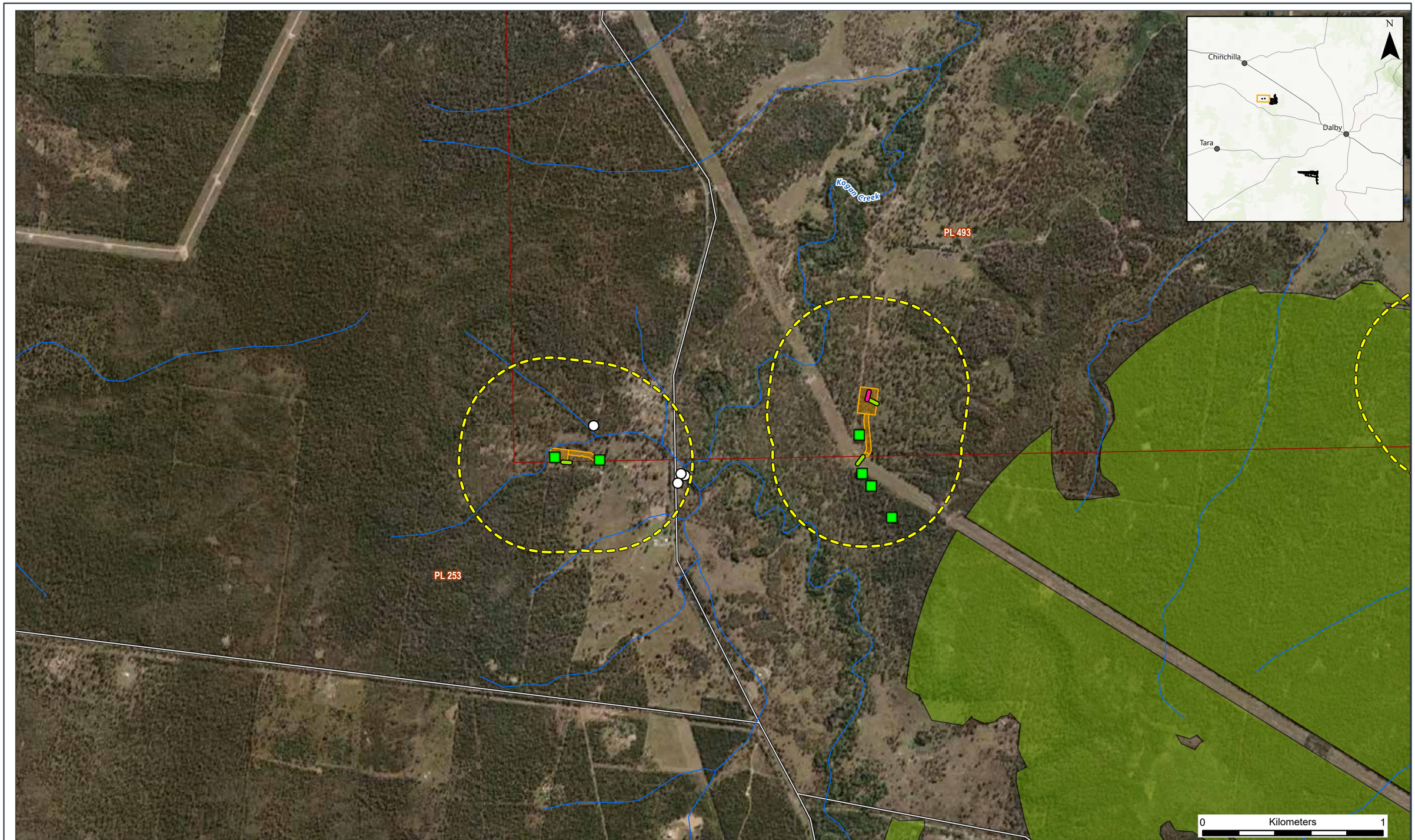
2.2.1.1 Protected plants surveys

Approximately 69 ha of the Project footprint is within NC Act protected plants high-risk trigger mapping (trigger mapping) (**Figure 2.1)**. Prior to clearing and in accordance with the NC Act Arrow will undertake 'protected plant surveys' of these areas and prepare a flora survey report to support either a clearing permit application (or exempt clearing notification) with an impact management plan to avoid and minimise impact on threatened plants community. Surveys will be conducted in accordance with the 'Flora Survey Guidelines – Protected Plants: *Nature Conservation Act 1992*' (Version 2.01, State of Queensland 2020).

The Project footprint has been traversed in its entirety, including the 'high-risk' trigger mapping areas, by Ecologists employing the use of secondary and quaternary assessments. Assessments were undertaken at necessary intervals to map vegetation, identify threatened species habitat and identify constraints such as the presence of threatened species.

A protected plant survey undertaken in April and May 2024 for a separate Arrow project overlaps with the southern part of the Wyalla field development and the meander survey is shown on **Figure 2.1**.

A map of the Project disturbance footprint intersecting the trigger mapping and a 100 m buffer (clearing impact area) is shown on **Figure 2.1**.



Flora Survey Effort (Page 1 of 6)

SGP SOUTH

- Linear Survey
- Observation Site
- Quaternary Site
- Secondary Site
- Tertiary Site
- Watercourse
- BioCondition Transect
- EFS Transect
- Quaternary Transect
- RHM Tramsect
- Rehab Assessment Transect
- Secondary Transect
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- Protected Plants High Risk Area
- HRTM 100m Buffer
- PL Granted

Attexo

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FIGURE 2.1

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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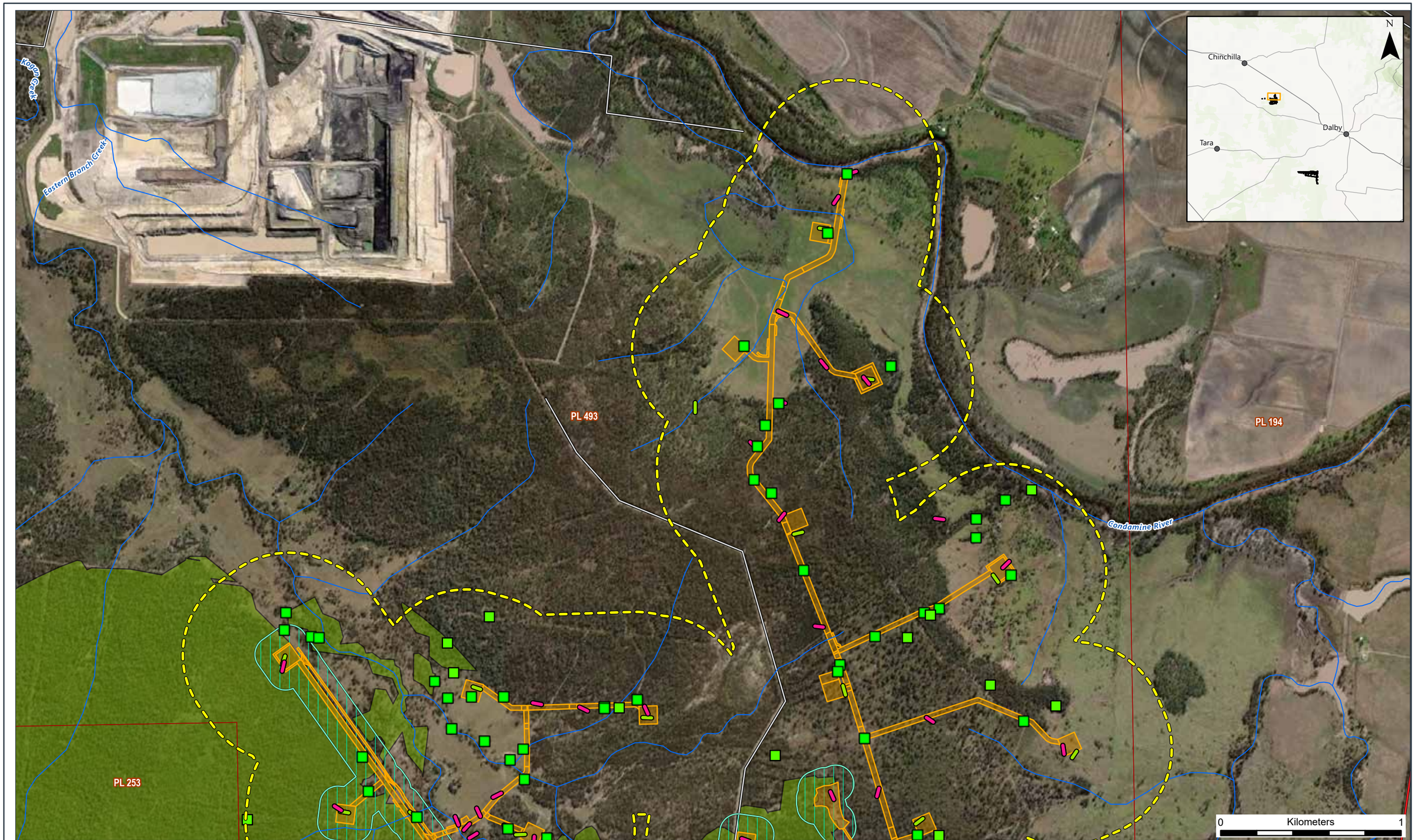

Flora Survey Effort (Page 2 of 6)

SGP SOUTH

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Attexo

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FIGURE 2.1

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
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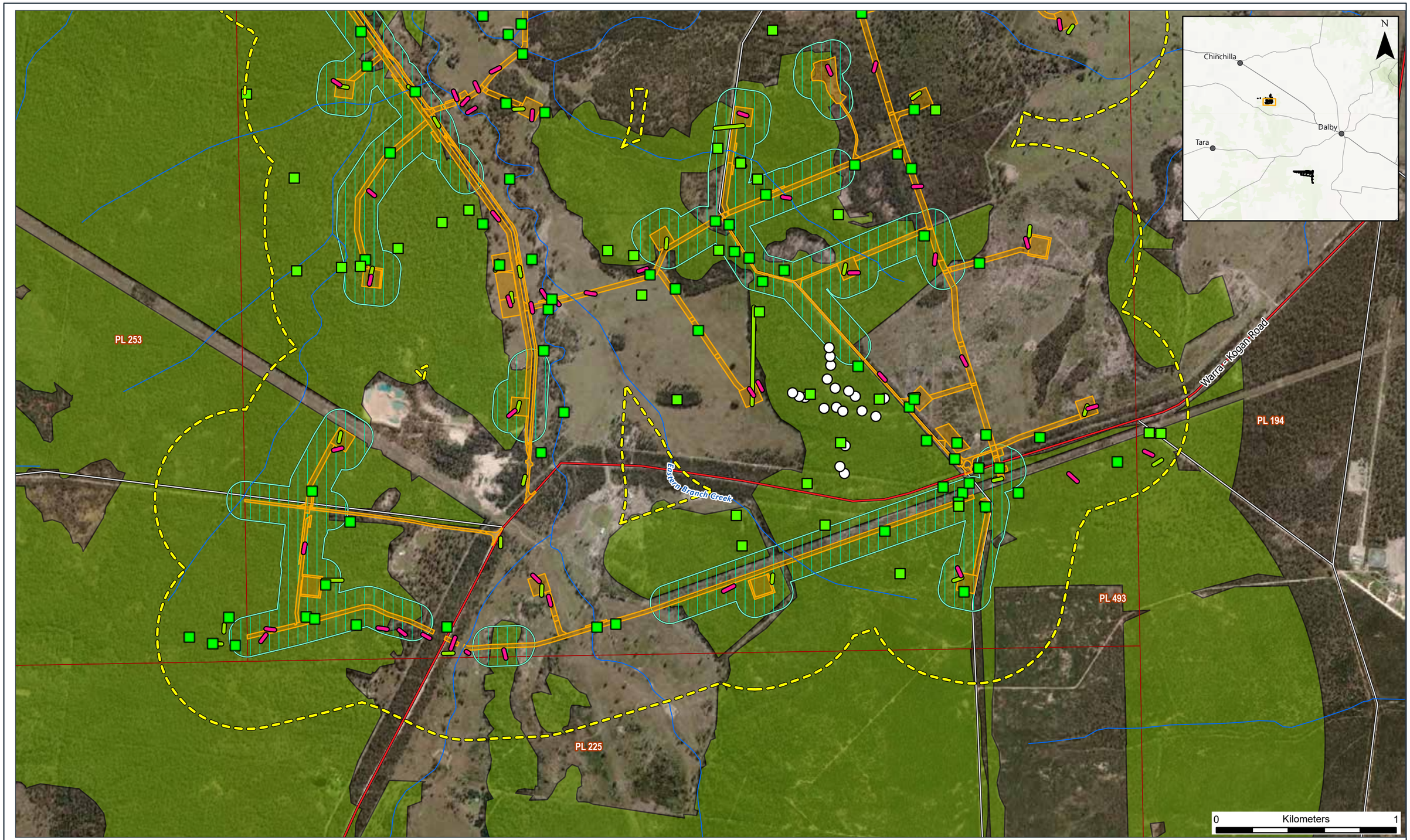

Flora Survey Effort (Page 3 of 6)

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Attexo

REVIEWED: JC **DRAWN:** JT **SCALE (A3):** 1:20,000 **DATE:** 30/01/2025 **DWG No:** ARR-002_119[C] **FIGURE 2.1**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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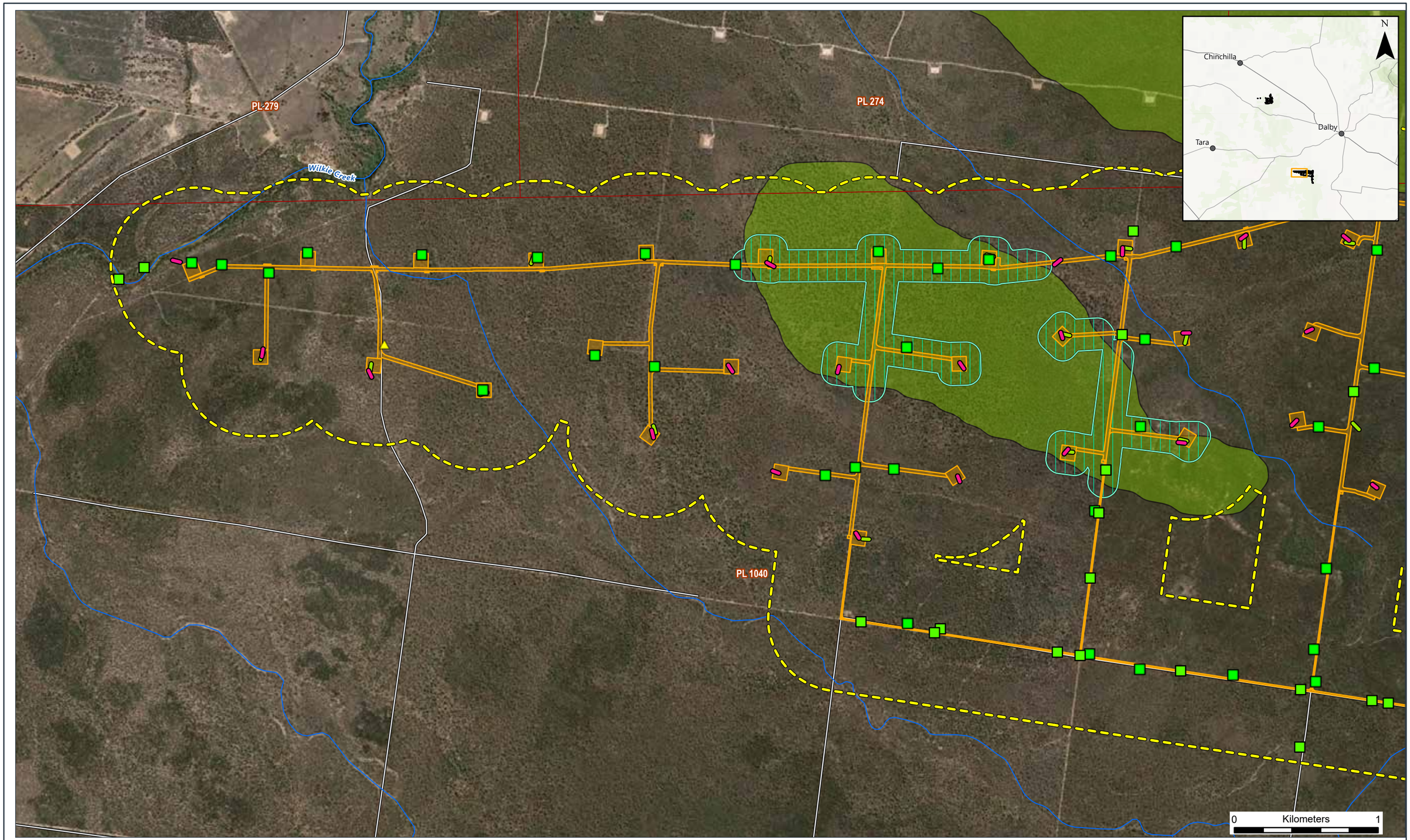

Flora Survey Effort (Page 4 of 6)

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Attexo

REVIEWED: JC **DRAWN:** JT **SCALE (A3):** 1:25,000 **DATE:** 30/01/2025 **DWG No:** ARR-002_119[C] **FIGURE 2.1**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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Flora Survey Effort (Page 5 of 6)

SGP SOUTH

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FIGURE 2.1

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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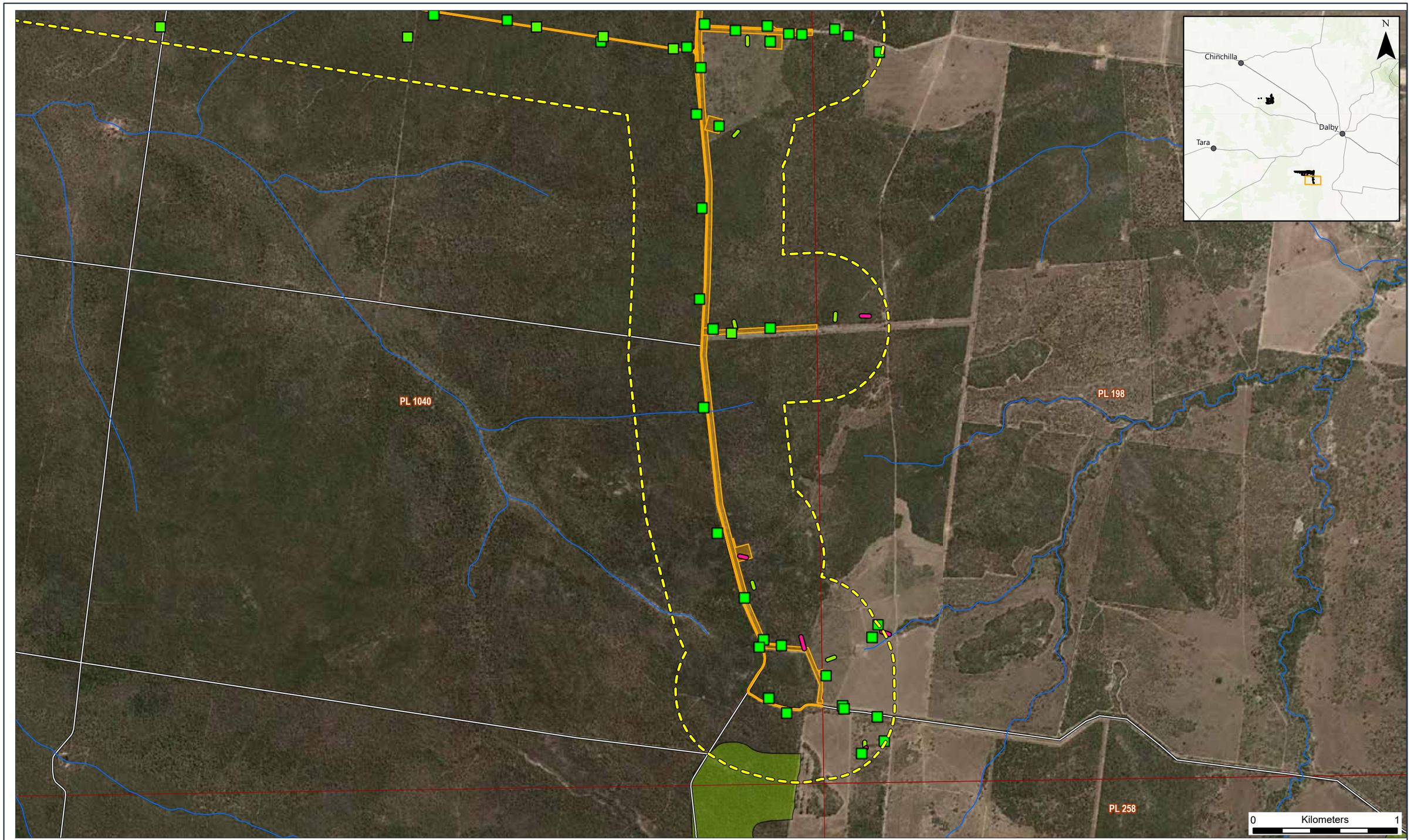

Flora Survey Effort (Page 6 of 6)

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Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_119[C] | **FIGURE 2.1**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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2.2.2 Terrestrial fauna survey

The habitat types in the Study area are widely distributed across the Brigalow Belt and have been extensively sampled as part of a substantial and sustained flora and fauna survey effort across the broader SGP Study area between 2011 and 2024. As a result of this effort, fauna assemblages and characteristic microhabitats associated with the broad vegetation communities and habitats in the Study area are well understood.

The primary Project-specific field assessments that inform the description of terrestrial fauna habitats and fauna assemblages in the Study area are derived from Terrestrial fauna surveys conducted by EcoSmart in October 2016 and March 2017.

Since 2017, these fauna surveys have been supplemented by habitat assessments, Koala Spot Assessment Technique (SAT) surveys and opportunistic fauna observations undertaken by Arrow field ecologists.

2.2.2.1 Main fauna survey effort

Areas for field survey were identified based on the results of desktop searches and interpretation of aerial photography to select patches of remnant and non-remnant vegetation for targeted fieldwork. The broader terrestrial fauna surveys were conducted by EcoSmart in 2016 and 2017, and the following methodology was applied to select sites for further assessment:

- areas with little or no historic survey effort were identified by overlaying the locations of previous fauna work on pre-existing RE mapping to identify focus areas for the fauna survey;
- Broad Vegetation Group (BVG) mapping prepared by the Queensland Herbarium was used to identify the location and extent of BVGs at the 2 million scale. The contribution of each BVG to the extent of remnant vegetation was calculated and theoretical trap effort distributed accordingly;
- a five-day pilot study was conducted in August 2016 to visually inspect focus areas, identify survey constraints and located possible detailed fauna trap surveys; and
- detailed survey sites were selected on the basis of spatial and BVG stratification, taking into consideration landholder access constraints, travel logistics and limitations, notable geomorphological features such as rock outcrops and caves, habitats likely to support specially protected species and vegetation condition (in particular, fire scarring).

Once selected, each site was inspected and approved by traditional owners to ensure trapping activities would not impact upon indigenous cultural values. As no pitfall trapping could occur without prior cultural heritage assessment, trap site locations could not be relocated after the pilot study. The pilot study occurred prior the flora investigations and did not account for any subsequent vegetation mapping changes.

Where possible, trap sites were surveyed during both the dry and wet season, though in some cases this was not possible without compromising spatial or BVG representation.

Trap Sites: These trap sites consisted of a combination of several trapping techniques that were tailored to the available habitat and the fauna species being targeted including pitfall trapping, Elliot trapping and funnel trapping typically deployed for four nights in each location. Pitfall trapping involved the installing four 20 L buckets along drift fences established in a T configuration. Funnel traps were installed at the end of these drift fences, augmenting the pitfall traps. Elliot traps were established in the vegetation surrounding the pitfall/funnel trap array, located approximately 5 m apart from each other. Trapping sites were visited twice daily, once in the morning and once in the late afternoon. Traps typically deployed for four nights at each location in accordance with the recommended survey effort set out in Table 4 of the *Terrestrial Fauna Survey Guidelines* (DES, 2022):

- 4 pitfall traps (representing 432 trap nights);
- 6 funnel traps (representing 648 trap nights); and
- 10 Elliot traps (representing 1,080 Elliot trap nights).

Harp Traps: Insectivorous micro-bat capture was undertaken using harp traps which were deployed along obvious flyways, which are linear clearings through vegetation such as tracks and creek lines. Harp traps were typically conducted in different locations to the other terrestrial fauna trapping methods.

Camera Traps: Remote sensor cameras were used to survey small to large terrestrial vertebrates for four nights at each location. Cameras were baited by smearing quantities of peanut butter and macadamia oil on the ground within the detection zone.

Ultrasonic Bat Call Detection: Ultrasonic calls of micro-bats were recorded using Anabat devices that were set to record from dawn until dusk. The deployment locations were selected based on the likelihood of high bat activity, such as along flyways or over water bodies.

Bird Surveys: In addition to being undertaken at each trap site, opportunistic bird surveys were also conducted within other areas of suitable habitat throughout the consolidated survey program. Each bird survey was conducted for between 20 – 30 minutes and typically before 9 am.

Diurnal Search: Active diurnal searches undertaken throughout the Study area involved two observers meandering through suitable fauna habitat for 30 minutes rolling rocks and logs, searching debris, inspecting trees for scratches and searching for scats or feeding remains.

Koala SAT Surveys:. The SAT was adopted as the most appropriate survey technique at the time of these surveys in accordance with *The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas Phascolarctos cinereus* (Phillips S. &., 2011). This survey technique involved searching for Koala scats around the base of 30 suitable food trees at each survey site.

Spotlighting: Spotlighting surveys were conducted by two observers (on foot) who would walking through suitable and spotlight for arboreal and terrestrial mammal, reptile and amphibian species. Spotlighting surveys were typically conducted for periods of 60 minutes over two nights at each site with animals being detected by eye shine, call or direct observation.

Habitat Assessments: In addition to the direct survey methods used to detect fauna species, habitat assessments were also conducted throughout the Study area or within adjacent and representative vegetation. The focus of these assessments was to collect sufficient microhabitat information to inform the development of habitat mapping rules that have subsequently been adopted across the broader SGP.

Opportunistic Fauna Observations: Opportunistic observations of fauna species not previously noted or infrequently recorded were made during all survey efforts undertaken across the broader SGP. Opportunistic observations of threatened fauna species recorded within the Study area or within adjacent and representative vegetation have also been included in this biodiversity impact assessment.

The location of these fauna survey sites has been presented in **Figure 2.2** and **Table 2.2.**

Table 2.2 Summary of seasonal and detailed terrestrial fauna survey effort (EcoSmart 2017, EcoSmart 2019 and Arrow EFS 2011-2024)

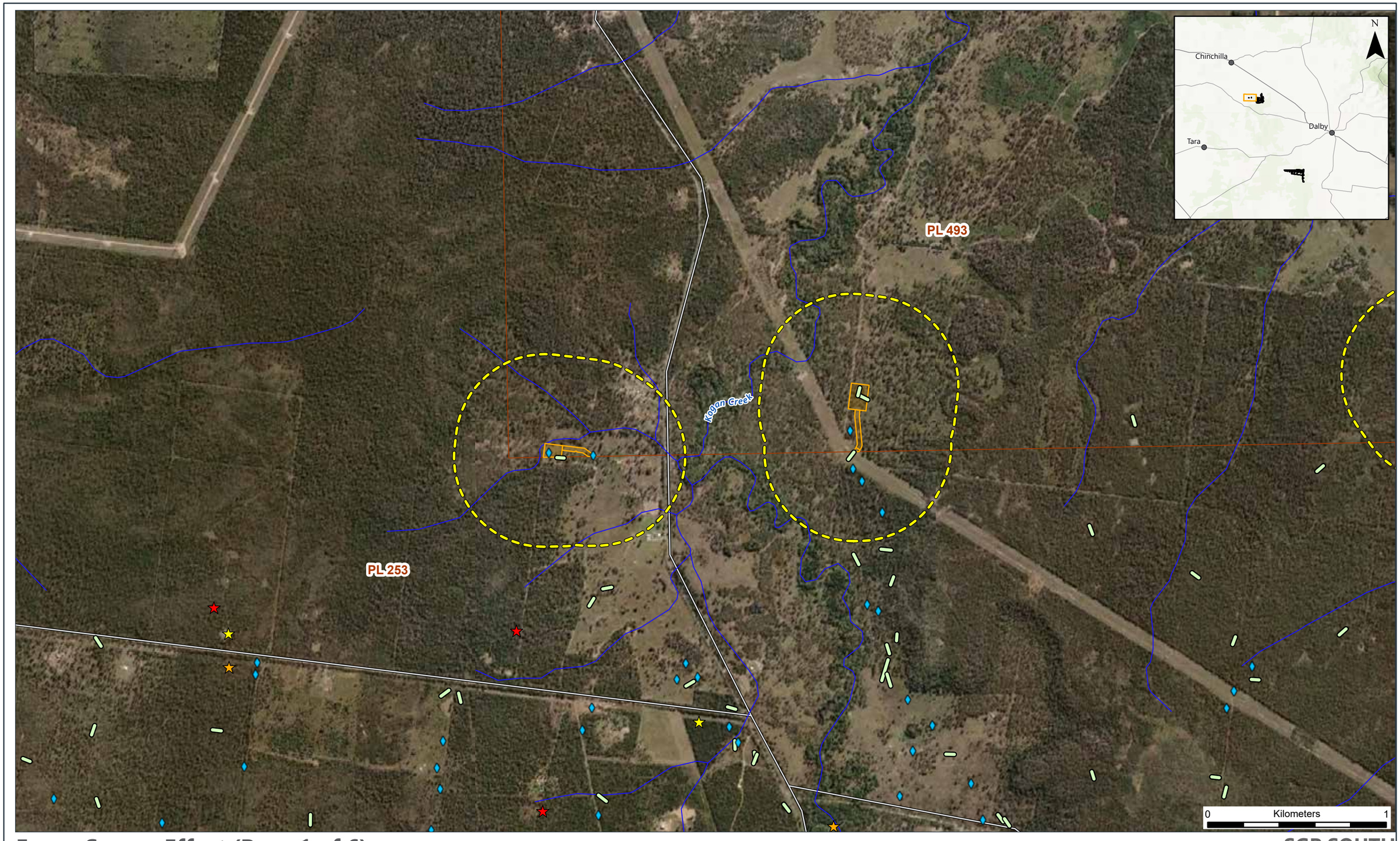
Survey Method	Survey effort (number of sites/duration)				Total survey effort by survey method (number of sites/ duration)
	EcoSmart			Arrow EFS	
Corresponding Report	2016 (EcoSM, 2017)	2017 (EcoSM, 2017)	2019 (EcoSM, 2019)	N/A	
Pitfall Traps	10 (160 nights)	10 (160 nights)	-	-	20 (320 nights)
Funnel Traps	10 (240 nights)	10 (240 nights)	-	-	20 (480 nights)
Elliot Traps	10 (400 nights)	10 (400 nights)	-	-	20 (800 nights)
Diurnal Searches	13 (13 hours)	15 (15 hours)	18 (18 hours)	17 (17 hours)	63 (63 hours)
Bird Surveys	18 (12 hours)	15 (10 hours)	-	-	33 (22 hours)
Targeted GBC	6 (4 hours)	-	-	-	6 (4 hours)
Spotlighting	13 (19.5 hours)	17 (25.5 hours)	-	-	30 (45 hours)
Camera Traps	13 (52 nights)	14 (56 nights)	-	-	27 (108 nights)
Anabats	9 (9 nights)	9 (9 nights)	-	-	18 (18 nights)
Koala Surveys	15 (10 hours)	11 (7 hours)	63 (42 hours)	2 (1 hour)	91 (61 hours)
Harp Traps	9 (27 nights)	10 (30 nights)	-	-	19 (57 nights)

2.2.2.2 Supplementary fauna survey

Since 2017, the main fauna survey effort has been supplemented with numerous high level pre-clearance surveys and habitat assessments undertaken by Arrow and EcoSmart field ecologists (refer **Table 2.3**). EFS survey sheets are included as **Appendix E**.

Table 2.3 Pre-clearance fauna survey effort (Arrow/Attexo ecological assessments)

Survey	Off-Tenement Terrestrial Surveys (EcoSM, 2019)	Ecological Field Survey (Arrow, 2020-2023)
Habitat assessments and opportunistic observations	417	514



Fauna Survey Effort (Page 1 of 6)

SGP SOUTH

- Anabat Site
- Dinural Search
- Habitat Assessment (Spot)
- Harp Trap
- Koala Survey
- Observation Site
- Spotlighting Survey
- Trap Site
- Detailed trap sites (Elliot, Pitfall, Funnel + other methods)
- Detailed trap sites plus Harp (Elliot, Pitfall, Funnel, Harp + other methods)
- Harp trap sites (plus other methods)
- Other fauna detection methods
- Diurnal Search
- Habitat Assesement (Spot)
- Koala survey & Habitat assessment (spot)
- Watercourse
- Highway
- Main Road
- Local Road
- Project Footprint
- Study Area (500m Buffer)
- PL granted

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FIGURE 2.3

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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Fauna Survey Effort (Page 2 of 6)

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GDA2020 MGA Zone 56

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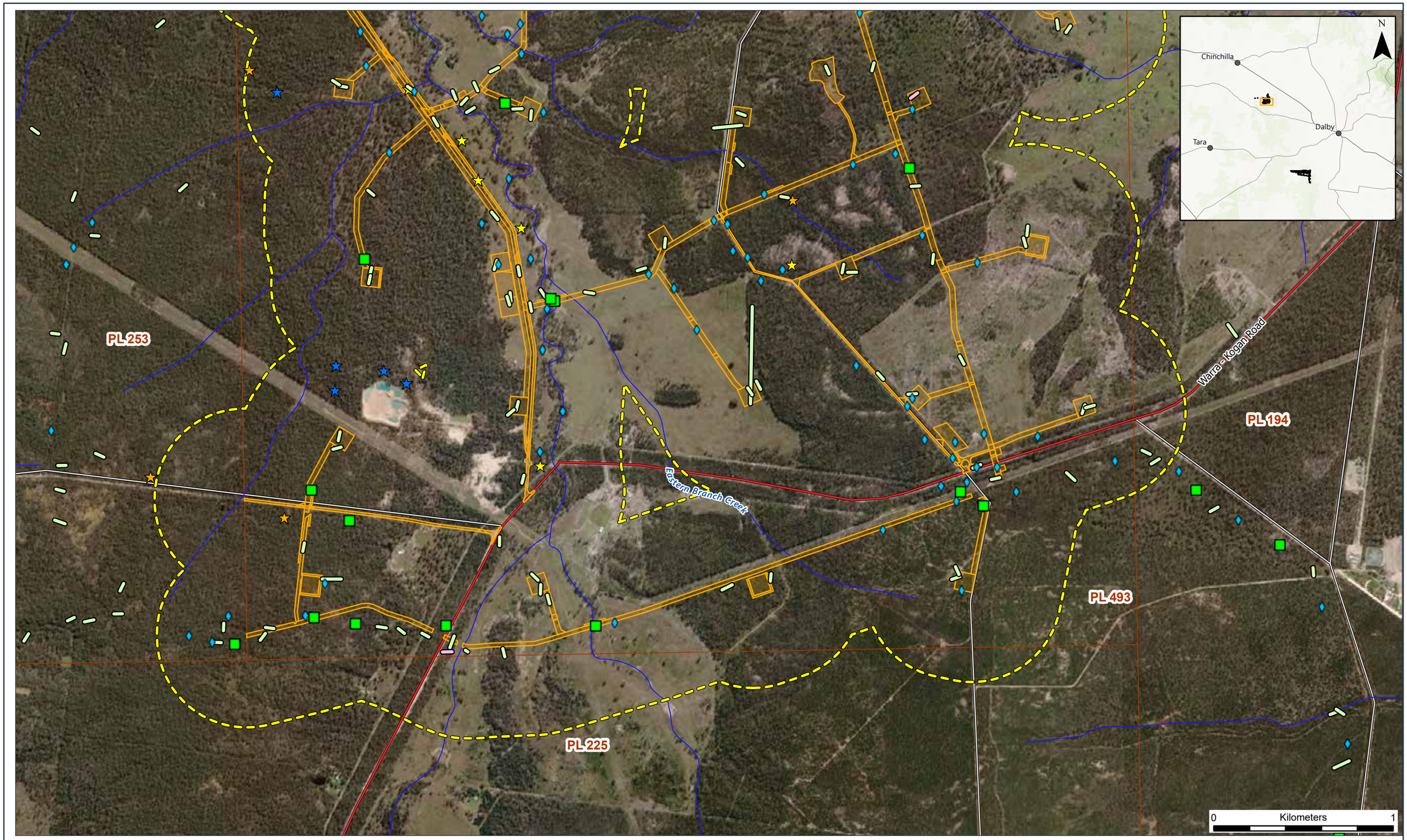

Fauna Survey Effort (Page 3 of 6)

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FIGURE 2.3

GDA2020 MGA Zone 56

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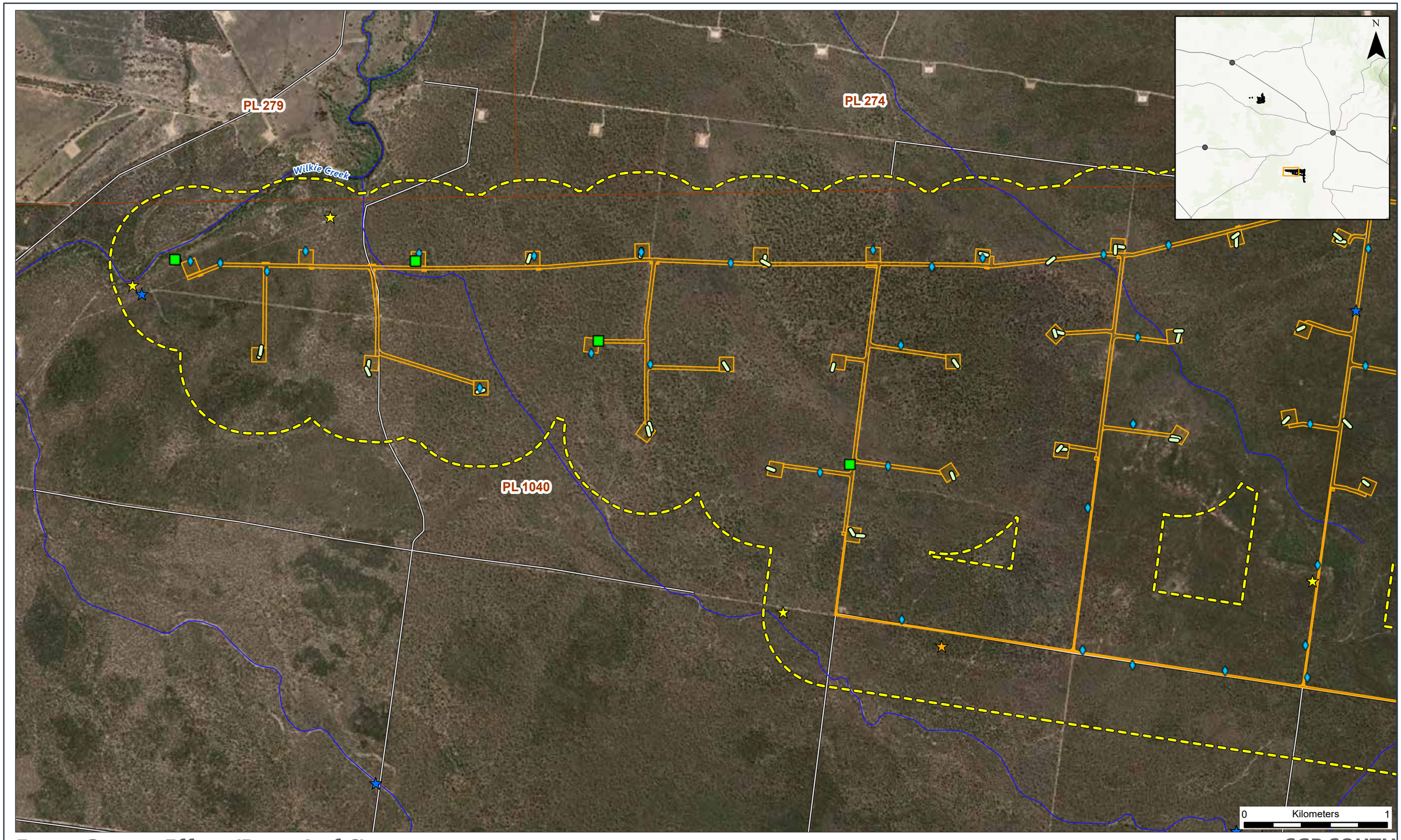

Fauna Survey Effort (Page 4 of 6)

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Attexo

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GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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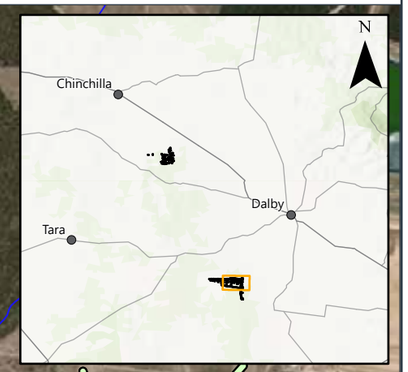
PL 274

PL 279

Broadwater Gully

PL 198

PL 1040



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Fauna Survey Effort (Page 5 of 6)

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FIGURE 2.3

GDA2020 MGA Zone 56

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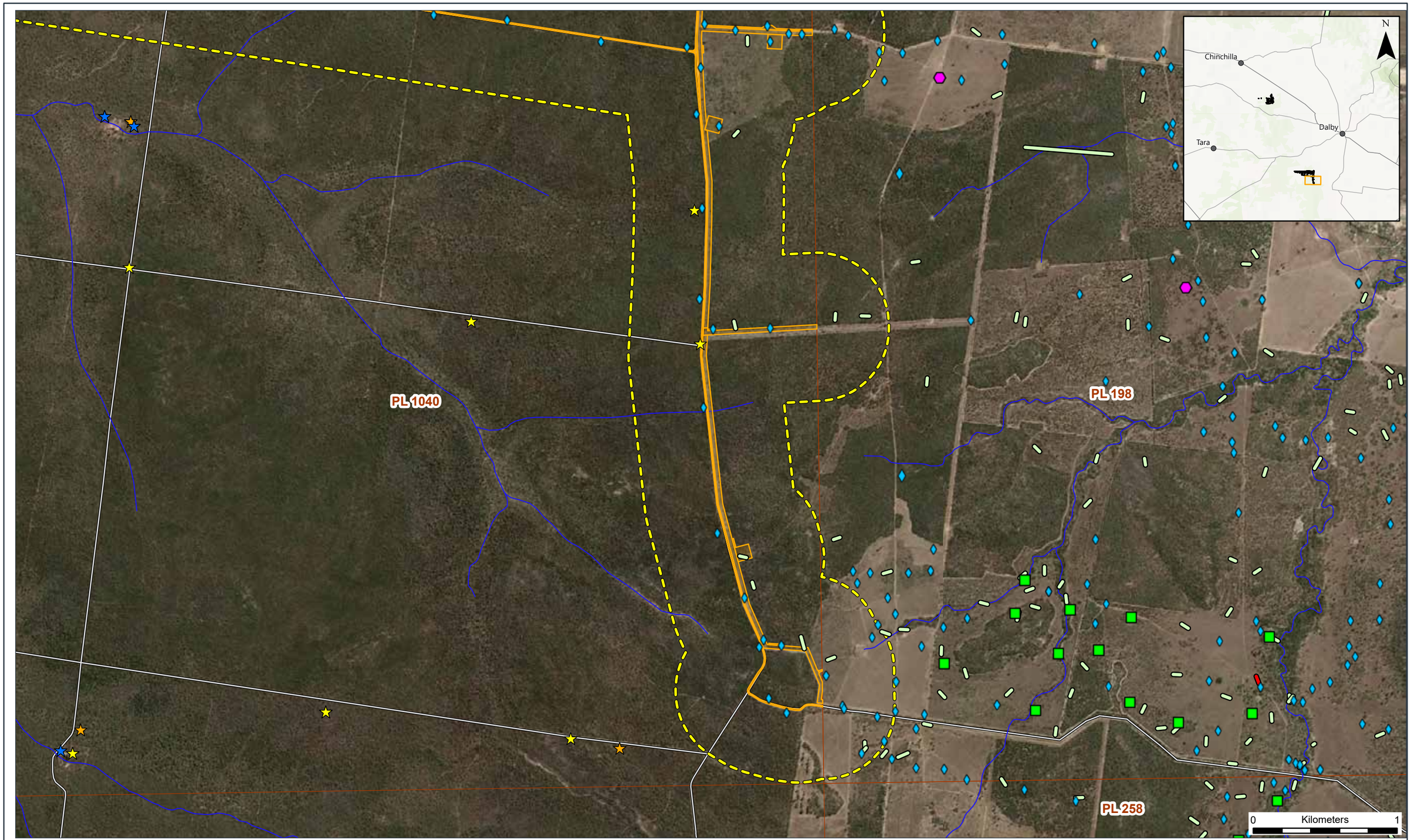

Fauna Survey Effort (Page 6 of 6)

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GDA2020 MGA Zone 56

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2.2.2.3 Targeted fauna survey

Targeted searches were used to detect Greater Glider, Koala and Glossy Black-cockatoo in areas of suitable habitat as part of the main fauna survey effort (EcoSmart, 2017) and subsequent EFS by Arrow's ecologists. Overall, the following targeted detection effort has been undertaken for the Project:

- Koala detection based on the SAT method (Phillips & Callaghan, 2011) but due to high densities of non-koala feed trees, the method was modified to include 20 eucalypt trees (rather than 30 trees of any species) or Koala evidence, whichever occurred first. A total of 91 SAT surveys have been undertaken in the Study area since October 2016.
- searches were also conducted under *Allocasuarina* spp. for Glossy Black-cockatoo feeding remains (orts). *Allocasuarina inophloia*, *A. littoralis* and *Casuarina cristata* are the primary food tree of this species in the southern Brigalow Belt. Ort searches were conducted until 20 feed trees had been searched or feeding remains located. Searches were only conducted in suitable habitat. In total, six active searches were conducted across the entire SGP.
- targeted surveys for Greater Glider are reflected in the spotlighting effort reported in **Table 2.2** (i.e. a total of 45 hours of spotlighting during the main survey effort between 2016 and 2017).

2.2.2.4 Survey for cryptic species

For the purposes of this assessment, a species is considered 'cryptic' if it is unlikely to be detected using standard survey techniques (trapping, searching or spotlighting). Of the fauna species considered 'likely' or 'possibly occurring' within the Study area, the following species are difficult to detect using these survey methods:

- Brigalow Woodland Snail, *Adclarkia cameroni;*
- Pale Imperial Hairstreak, *Jalmenus eubulus;*
- Dunmall's Snake, *Furina dunmalli*; and
- Grey Snake, Hemiaspis damelii.

The invertebrate species are typically associated with Brigalow habitats which are limited in extent in the Study area. While no specific surveys have been aimed at detecting these species, vegetation survey and habitat assessments have been conducted across most of the potential habitat areas and the primary Brigalow habitat areas have been avoided when locating Project-related infrastructure.

Both snake species are subterranean by nature (i.e. they spend most of their time underground) and are recognised as difficult to detect in relevant conservation guidelines. Spotlighting, opportunistic surveys and active searches are all appropriate survey methods for these species (refer **Table 2.2** and **Table 2.3**), which have not been detected in the Study area.

2.2.3 Threatened species habitat

As part of comprehensive ecological assessments for the broader SGP, EcoSmart and 3D Environmental (2017) developed habitat mapping rules that have been adopted by Arrow to map the distribution of threatened species habitat through the Study area. EcoSmart and 3D Environmental have recently undertaken a review of the original mapping rules and revised them based on new species listings and updated ecological information for the SGP South area. These habitat mapping rules have formed the basis of the habitat mapping presented in this report. Rules for individual species are addressed in **Section 3.2.2** (flora) and **Section 3.3.4** (fauna) of this report.

2.3 Impact analysis

The Project footprint and impact calculations provided by Arrow have been compared against Study area conditions and data in the EA Conditions. The scope of the assessment is summarised in **Section 1.3**.

Impacts to ESAs and PEMs are summarised in **Section 5.1** and **Section 5.2** and includes :

- interactions with Category A, B or C ESAs and the extent to which these are authorised by Condition (Biodiversity 8) *Protecting biodiversity values, Table 1* which restricts the kinds of activities that can be undertaken in ESAs and their protection zones;
- despite condition (Biodiversity 8A) *Protecting biodiversity values, Table 2* which limits the maximum significant disturbance that can be undertaken in ESAs; and
- interactions with values that are 'Prescribed Environmental Matters' under the EO Act and the extent to which these are authorised by Condition (Biodiversity 10) *Protecting biodiversity values, Table 3*.

Impacts on ESAs or PEMs in the Study area that are within existing approved limits under the current SGP South EA are taken to be approved, and *no further consideration has been given to these impacts or values*. Impacts on ESAs or PEMs that exceed existing approved limits or are not mentioned in the current EA are considered in **Section 5.0**.

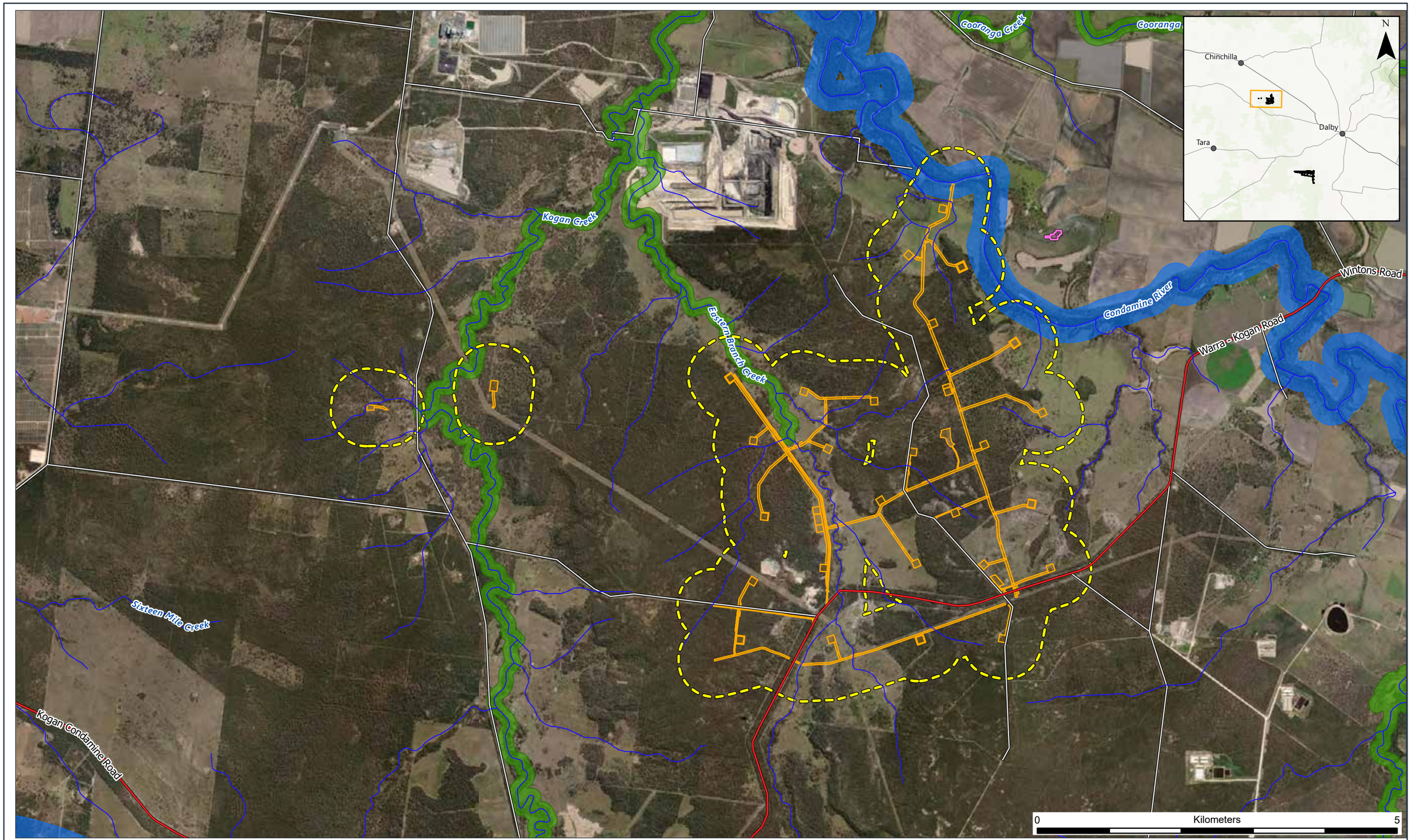
All impact calculations are based on GTRE mapping for the Study area in accordance with Condition (Biodiversity 3) of the SGP South EA, which states that "where mapped biodiversity values differ from [on-the-ground biodiversity values], petroleum activities may proceed…based on the confirmed on-the-ground biodiversity value".

3.0 Description of ecological values

The Study area is located to the north-east (northern portion of the Study area) and south-east (southern portion of the Study area) of Tara in the Brigalow Belt bioregion. The majority of the Study area (both northern and southern) are located within the Inglewood Sandstones sub-bioregion. However, an area of the northern portion of the Study area is within the Eastern Darling Downs sub- bioregion.

The northern portion of the Study area can generally be described as grazing lands dominated by dry eucalypt woodlands to open woodlands interspersed with small areas of open forest to woodland dominated by Poplar Box (*Eucalyptus populnea*) or Silver-leaved Ironbark (*E. melanophloia*) and Spotted Gum (*Corymbia citriodora*). These dominant vegetation types are dissected by riparian open forests to woodlands associated with Eastern Branch Creek and Kogan Creek. There are no Terrestrial Biodiversity Corridors or buffers within the northern portion of the Study area. However, riparian corridors for the Condamine River, Eastern Branch Creek and Kogan Creek intersect the Study area, but are not within the Project footprint (refer **Figure 3.1**).

The southern portion of the Study area is mostly in the Kumbarilla State Forest and can generally be described as dry eucalypt woodland to open forests on sand plains and lateritic duricrusts. The woodlands are dominated by Gum Top Ironbark (*Eucalyptus decorticans*), Narrow-leaved Ironbark (*E. Crebra*) and/or Poplar Box (*Eucalyptus populnea*). There are no Terrestrial Biodiversity Corridors or buffers within the southern portion of the Study area. However, riparian corridor for Wilkie Creek intersect the Study area, but are not within the Project footprint (refer **Figure 3.1**).



Ecological Context (Page 1 of 2)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- State Forest
- MSES High Ecological Significance Wetlands
- State Biodiversity Corridor
- Regional Biodiversity Corridor

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REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:50,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_119[C] | **FIGURE 3.1**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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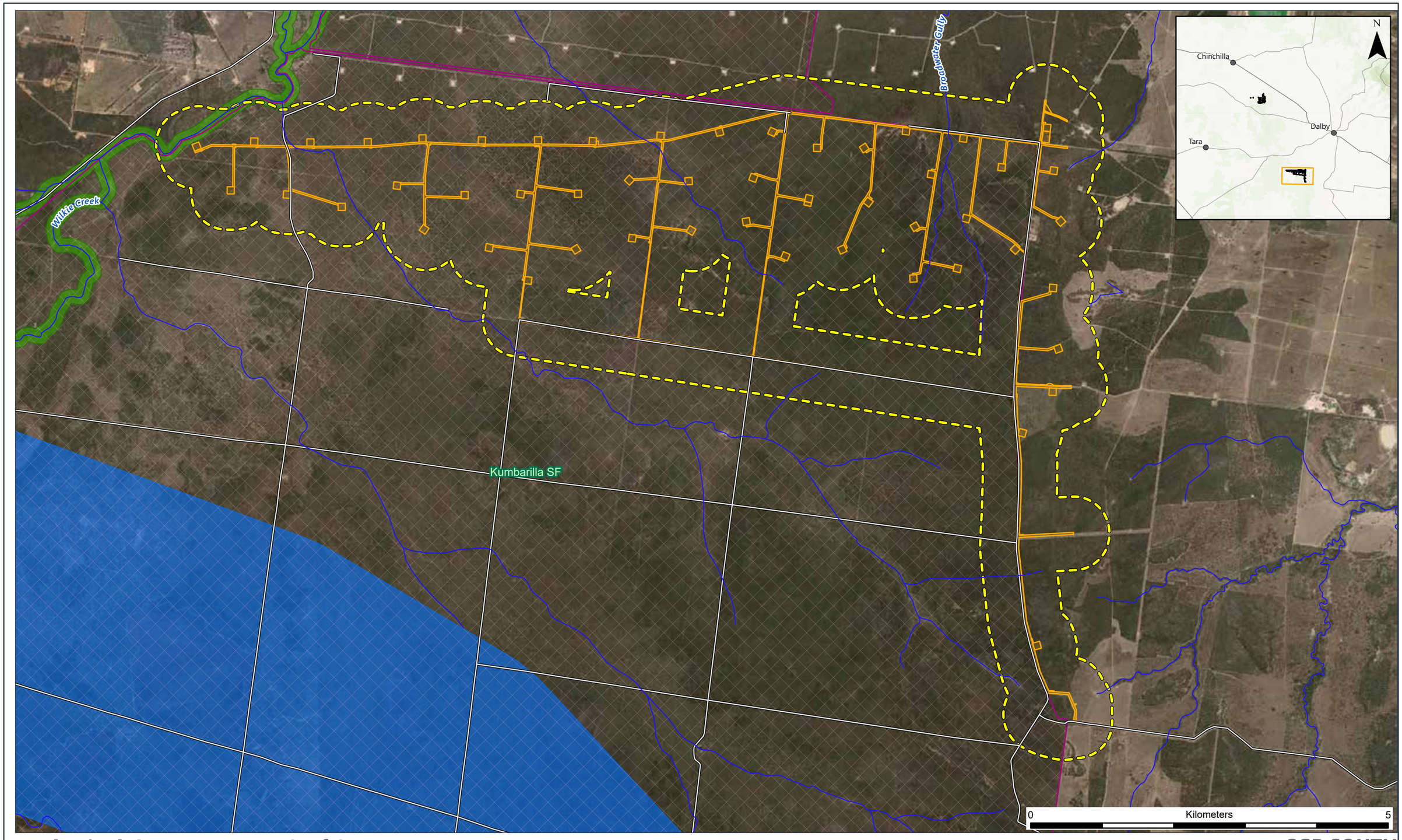

Ecological Context (Page 2 of 2)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- State Forest
- MSES High Ecological Significance Wetlands
- State Biodiversity Corridor
- Regional Biodiversity Corridor

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FIGURE 3.1

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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3.1.1 Environmentally Sensitive Areas

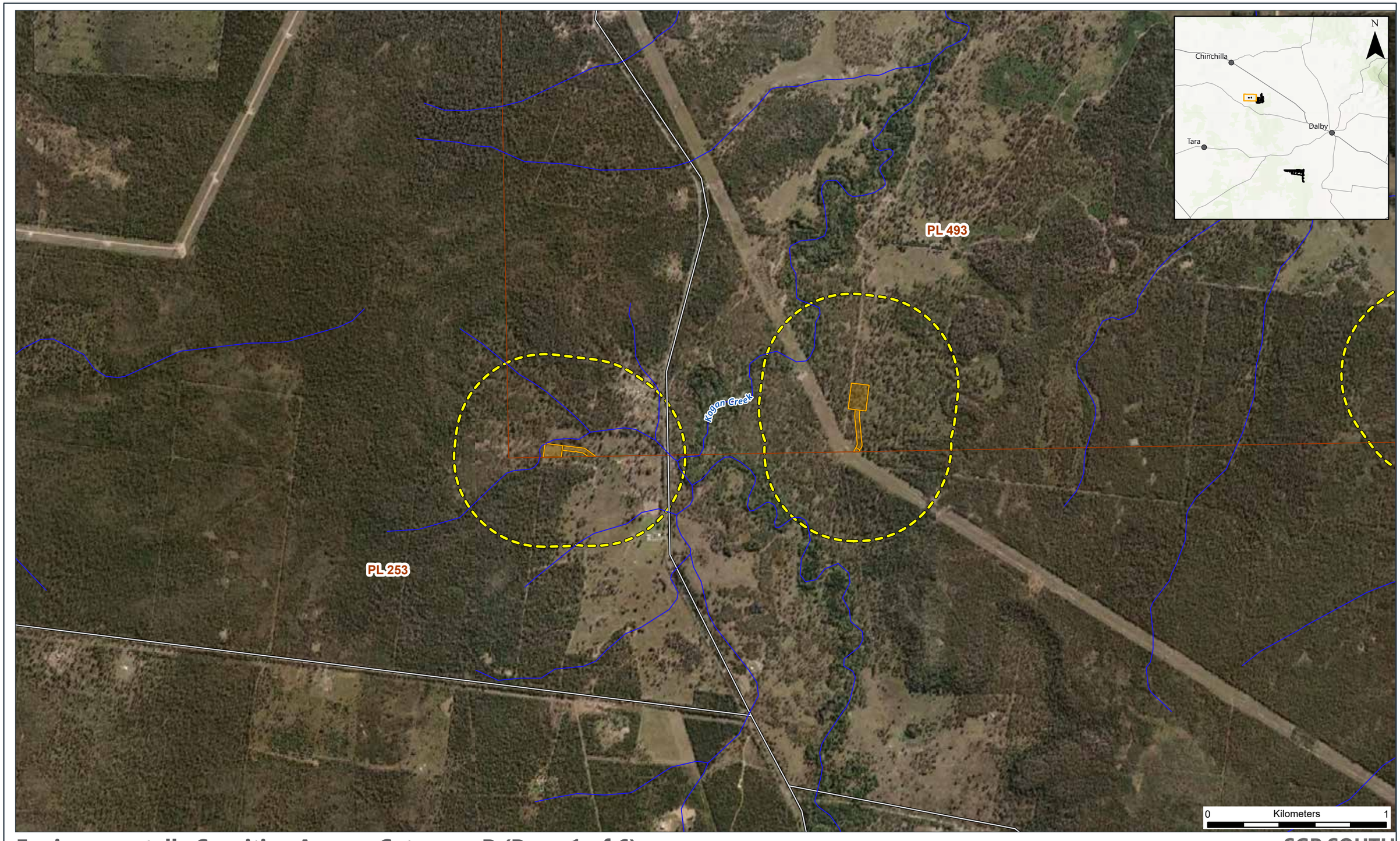
A summary of the ESAs as defined in the *Environmental Protection Regulation 2019* (EP Reg) (for Category A & B ESAs), eligibility criteria and standard conditions for petroleum pipeline activities (DEHP, 2013) is provided in **Table 3.1**. It should be noted that the inclusion of a recent definition change for Category C ESAs that is Protected Wildlife Habitat by DETSI that are relevant to the Project have been provided in **Table 3.1** and shown in **Figure 3.2, Figure 3.3** and **Figure 3.4** and has been included for completeness noting it is currently not conditioned or defined in the EA at present. Considering the location of the Project, ESAs relating to marine areas have been excluded from this assessment.

Table 3.1 SGP South Environmentally Sensitive Areas

ESA Category	ESA Type	Occurrence in Study area
Category A	Any of the following under the *Nature Conservation Act 1992:* • a national park (scientific) • a national park • a national park (Aboriginal land) • a national park (Torres Strait Islander land) • a national park (Cape York Peninsula Aboriginal • land) • a conservation park • a special wildlife reserve • a forest reserve.	None
	The Wet Tropics Area under the *Wet Tropics World Heritage Protection and Management Act 1993*.	None
	The Great Barrier Reef Region under the *Great Barrier Reef Marine Park Act 1975* (Cwlth);	None
	A marine park under the Marine Parks Act 2004, other than a part of the park that is a general use zone under that Act.	None
Category B	Any of the following areas under the *Nature Conservation Act 1992*: • a coordinated conservation area • an area of critical habitat or major interest identified under a conservation plan • an area subject to an interim conservation order.	None
	An area subject to the following conventions to which Australia is a signatory: • the 'Convention on the Conservation of Migratory Species of Wild Animals' (Bonn, 23 June 1979);	None

ESA Category	ESA Type	Occurrence in Study area
	• the 'Convention on Wetlands of International Importance, especially as Waterfowl Habitat' (Ramsar, Iran, 2 February 1971); • the 'Convention Concerning the Protection of the World Cultural and Natural Heritage' (Paris, 23 November 1972).	
	A zone of a marine park under the *Marine Parks Act 2004* that is within a general use zone of the marine park under that Act.	None
	An area to the seaward side of the highest astronomical tide.	None
	The following under the *Queensland Heritage Act 1992*: • a place of cultural heritage significance • a Queensland heritage place, unless there is an exemption certificate issued under that Act.	None
	An area recorded in the Aboriginal Cultural Heritage Register established under the *Aboriginal Cultural Heritage Act 2003*, section 46, other than the area known as the 'Stanbroke Pastoral Development Holding', leased under the *Land Act 1994* by lease number PH 13/5398.	None
	A feature protection area, State forest park or Scientific area under the *Forestry Act 1959*.	None
	A declared fish habitat area under the *Fisheries Act 1994*.	None
	An 'Endangered Regional Ecosystem' identified in the Regional Ecosystem Description Database (REDD) (by biodiversity status).	RE 11.3.1 and RE 11.4.3 have been mapped within the northern portion of the Study area. These are discussed further in **Section 3.2.1.1** and mapped in **Figure 3.2**.
Category C	Nature refuges as defined in the conservation agreement for that refuge under the *Nature Conservation Act 1992*	None
	Koala habitat areas as defined under the Nature Conservation (Koala) Conservation Plan 2006	None
	State forests or timber reserves as defined under the *Forestry Act 1959*	The southern portion of the Study area is located within the Kumbarilla State Forest and mapped in **Figure 3.3**.
	Regional parks (previously known as resource reserves) under the *Nature Conservation Act 1992*	None

ESA Category	ESA Type	Occurrence in Study area
	An area validated as from ground-truthing surveys as 'essential habitat' on the Queensland Government essential habitat map in accordance with section 20AC of the *Vegetation Management Act 1999* for a species of wildlife listed as critically endangered, endangered, vulnerable under the *Nature Conservation Act 1992*	Mapped essential habitat for Koala and yellow-bellied glider (southern subspecies). These areas are discussed in **Section 3.2.6** and mapped in **Figure 3.3**.
	An area validated from ground-truthing surveys as 'protected wildlife habitat' that is category A, B or C on the remnant vegetation management map, in accordance with section 20A of the *Vegetation Management Act 1992*, for a species of wildlife listed as critically endangered, endangered or vulnerable under the *Nature Conservation Act 1992*.	Protected wildlife habitat for endangered and vulnerable species occurs within the Study area. Refer to **Section 3.2.3** and mapped in **Figure 3.4**.
	'Of concern regional ecosystems' that are remnant vegetation and identified in the database called 'RE description database' containing regional ecosystem numbers and descriptions.	RE 11.3.2, 11.3.3, 11.3.4, 11.3.25, and 11.3.27f are mapped in the Study area. These communities are discussed in **Section 3.2.1** and mapped in **Figure 3.3**.



Environmentally Sensitive Areas - Category B (Page 1 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted

Category B ESA:

- Category B ESA (200m Buffer)
- Category B ESA (300m Buffer)
- Category B ESA

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GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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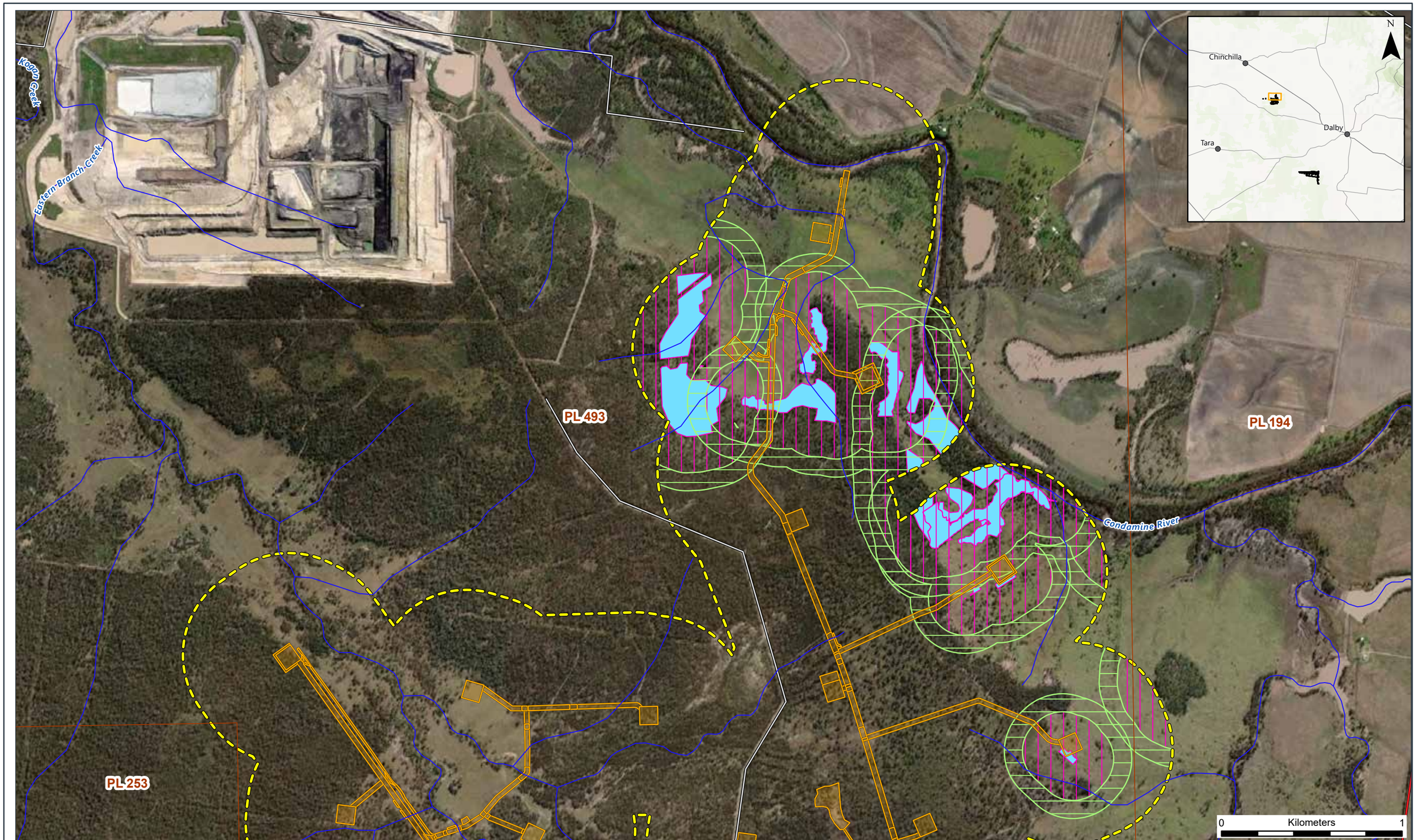

Environmentally Sensitive Areas - Category B (Page 2 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted

Category B ESA:

- Category B ESA (200m Buffer)
- Category B ESA (300m Buffer)
- Category B ESA

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FIGURE 3.2

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Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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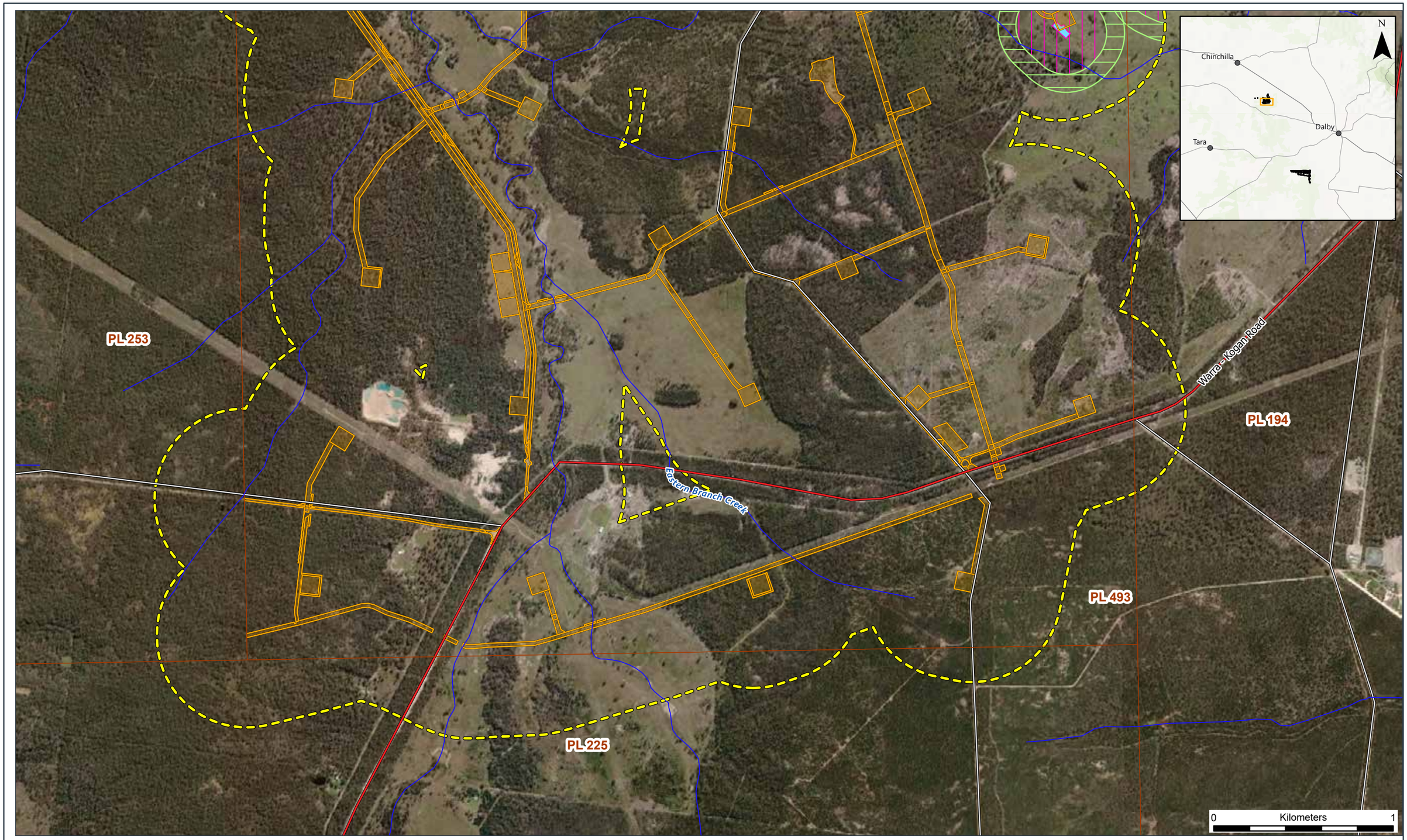

Environmentally Sensitive Areas - Category B (Page 3 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted

Category B ESA:

- Category B ESA (200m Buffer)
- Category B ESA (300m Buffer)
- Category B ESA

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GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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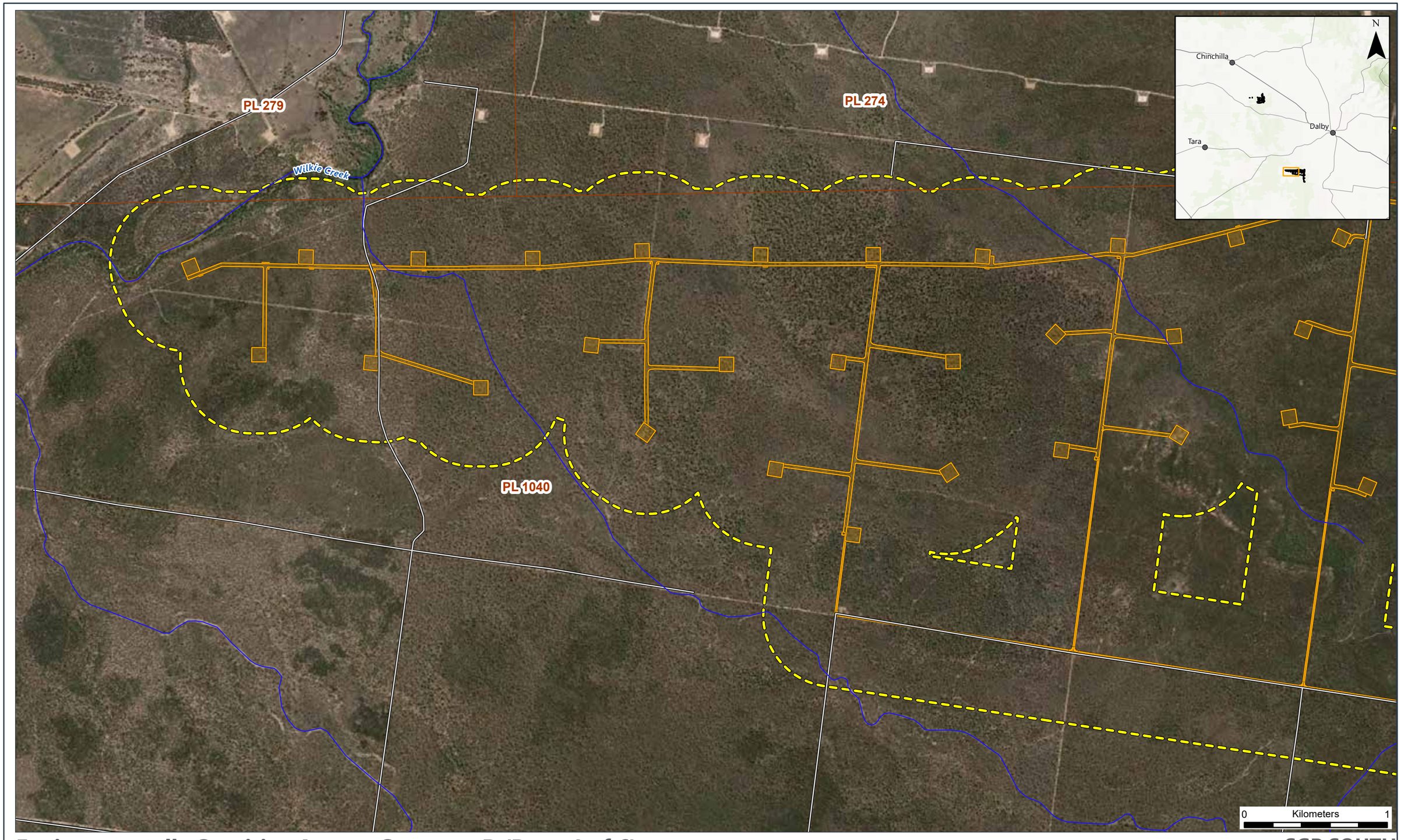

Environmentally Sensitive Areas - Category B (Page 4 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted

Category B ESA:

- Category B ESA (200m Buffer)
- Category B ESA (300m Buffer)
- Category B ESA

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FIGURE 3.2

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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Environmentally Sensitive Areas - Category B (Page 5 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted

Category B ESA:

- Category B ESA (200m Buffer)
- Category B ESA (300m Buffer)
- Category B ESA

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FIGURE 3.2

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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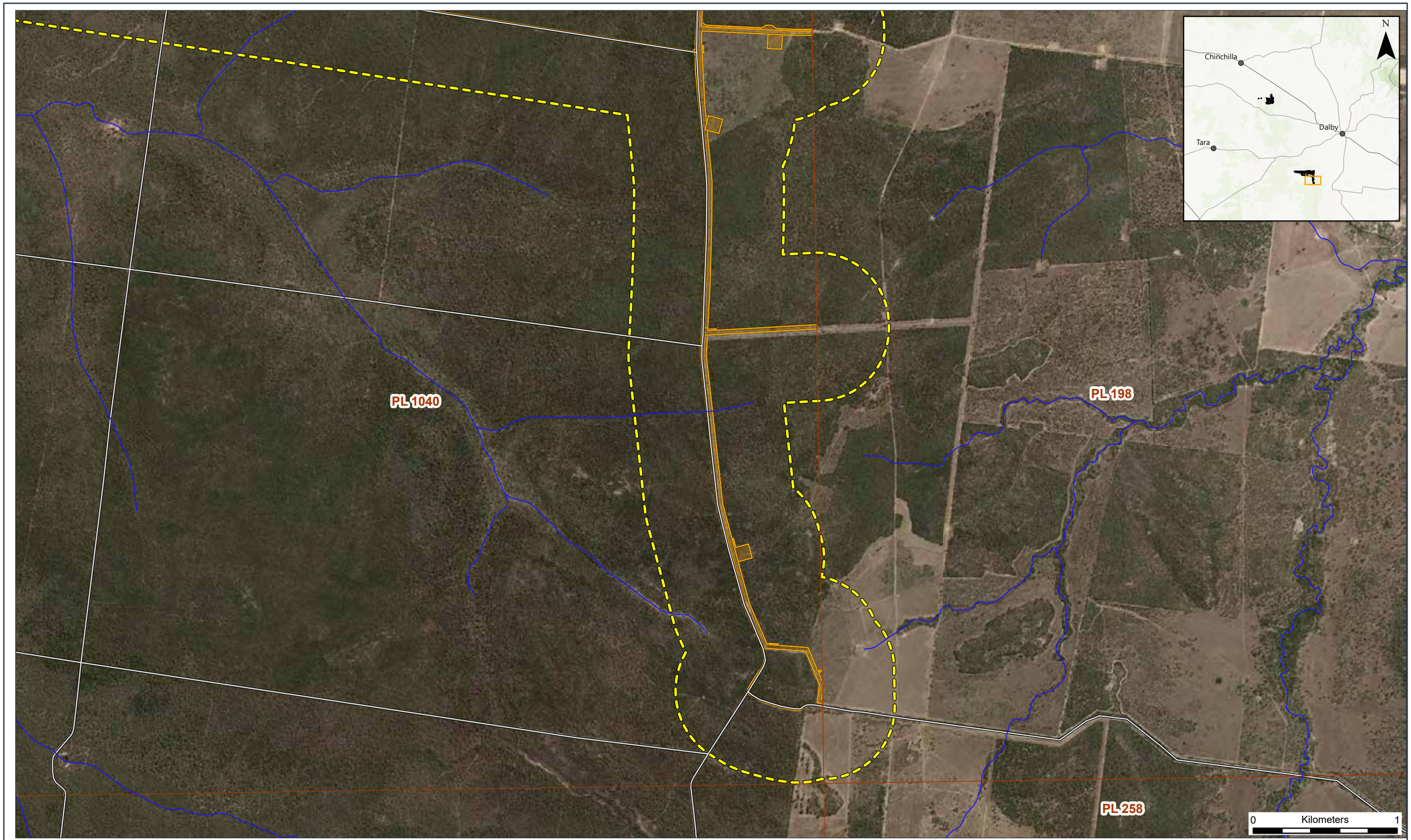

Environmentally Sensitive Areas - Category B (Page 6 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted

Category B ESA:

- Category B ESA (200m Buffer)
- Category B ESA (300m Buffer)
- Category B ESA

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FIGURE 3.2

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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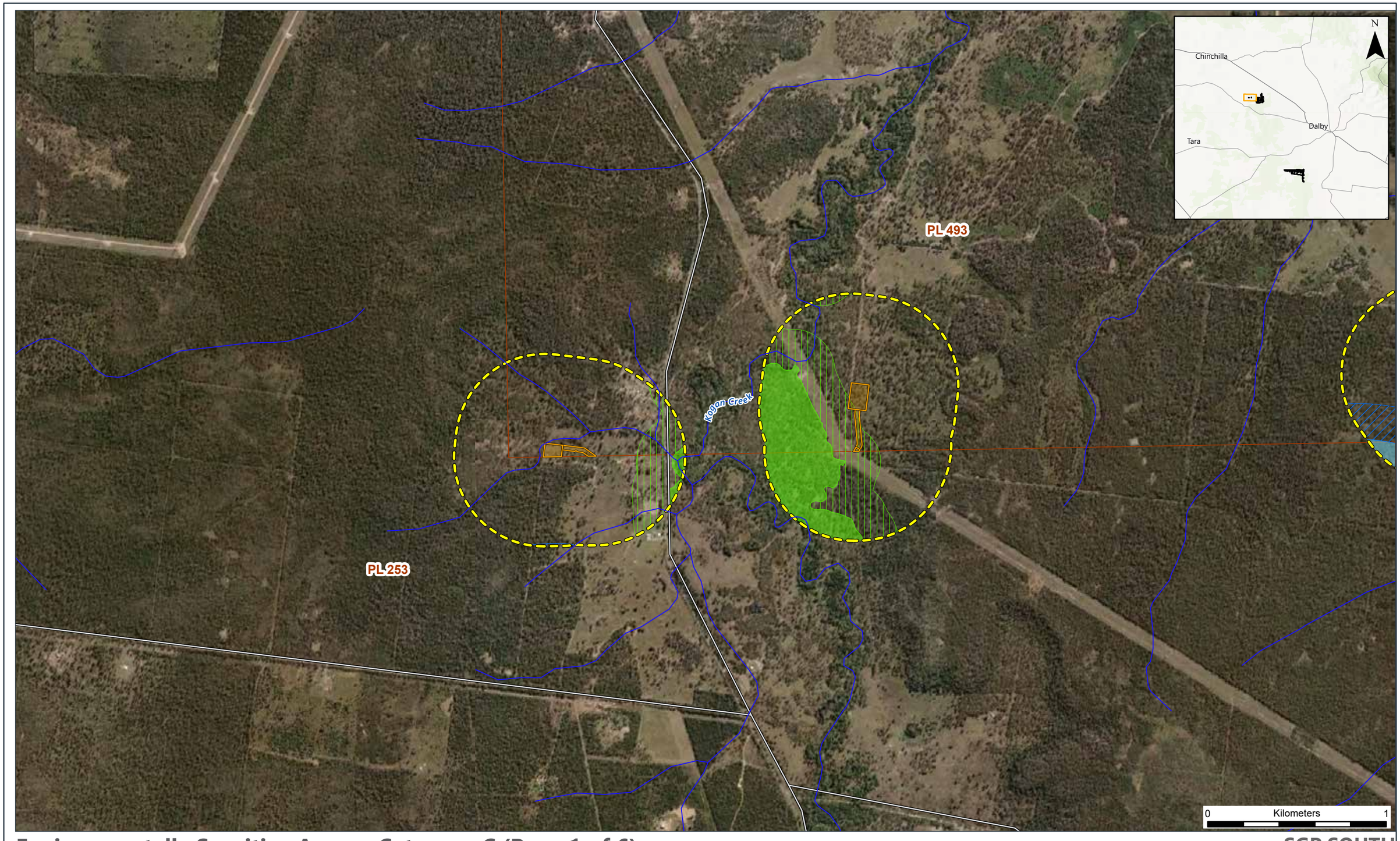

Environmentally Sensitive Areas - Category C (Page 1 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Project Footprint
- Study Area (500m Buffer)
- PL granted

ESA Category C:

- State Forest
- State Forest (200m Buffer)
- Of Concern RE
- Of Concern RE (200m Buffer)
- Essential Habitat
- Essential Habitat (200m Buffer)

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FIGURE 3.3

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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Environmentally Sensitive Areas - Category C (Page 2 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Project Footprint
- Study Area (500m Buffer)
- PL granted

ESA Category C:

- State Forest
- State Forest (200m Buffer)
- Of Concern RE
- Of Concern RE (200m Buffer)
- Essential Habitat
- Essential Habitat (200m Buffer)

Attexo

REVIEWED: JC **DRAWN:** JT **SCALE (A3):** 1:20,000 **DATE:** 30/01/2025 **DWG No:** ARR-002_122[C] **FIGURE 3.3**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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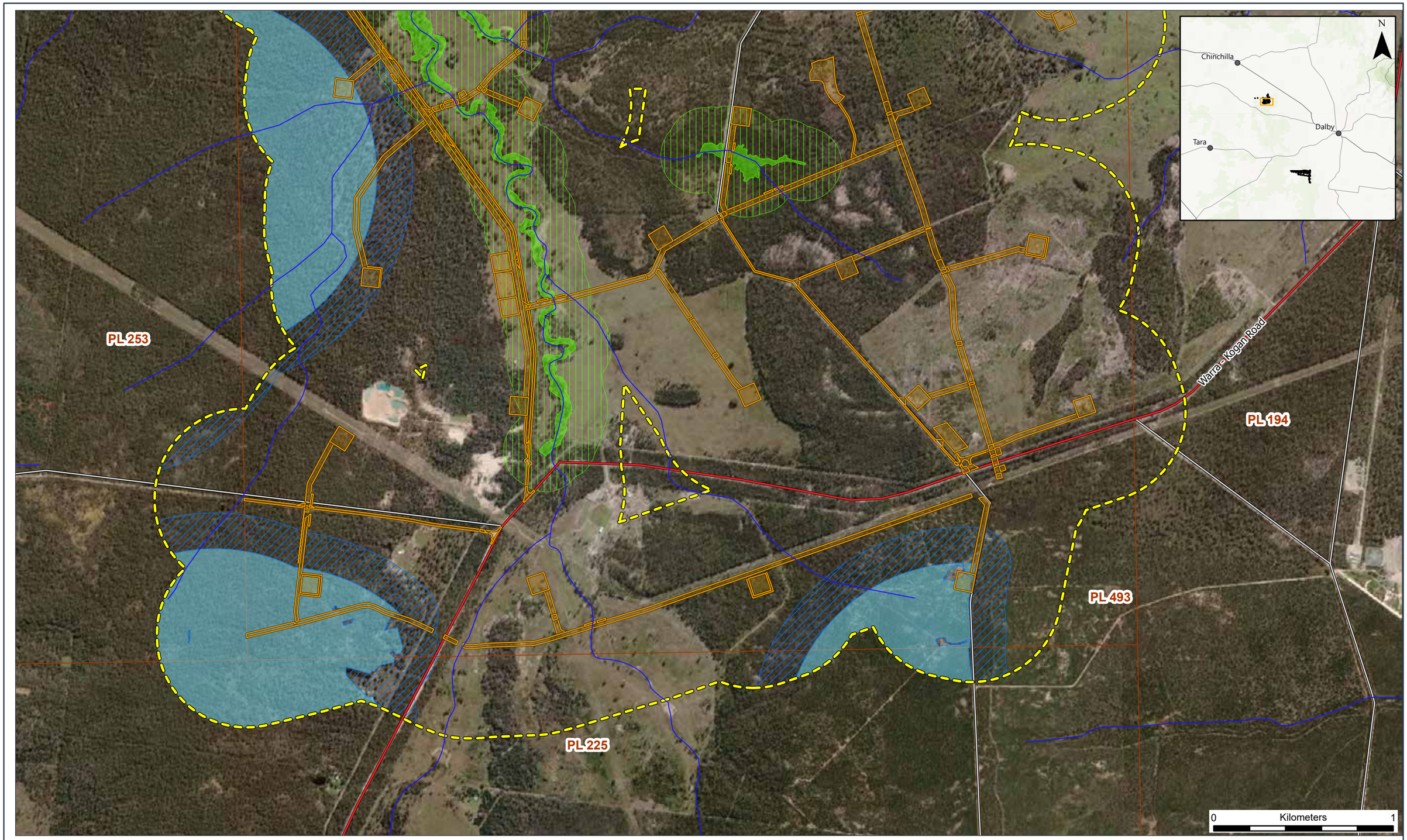

Environmentally Sensitive Areas - Category C (Page 3 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Project Footprint
- Study Area (500m Buffer)
- PL granted

ESA Category C:

- State Forest
- State Forest (200m Buffer)
- Of Concern RE
- Of Concern RE (200m Buffer)
- Essential Habitat
- Essential Habitat (200m Buffer)

Attexo

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GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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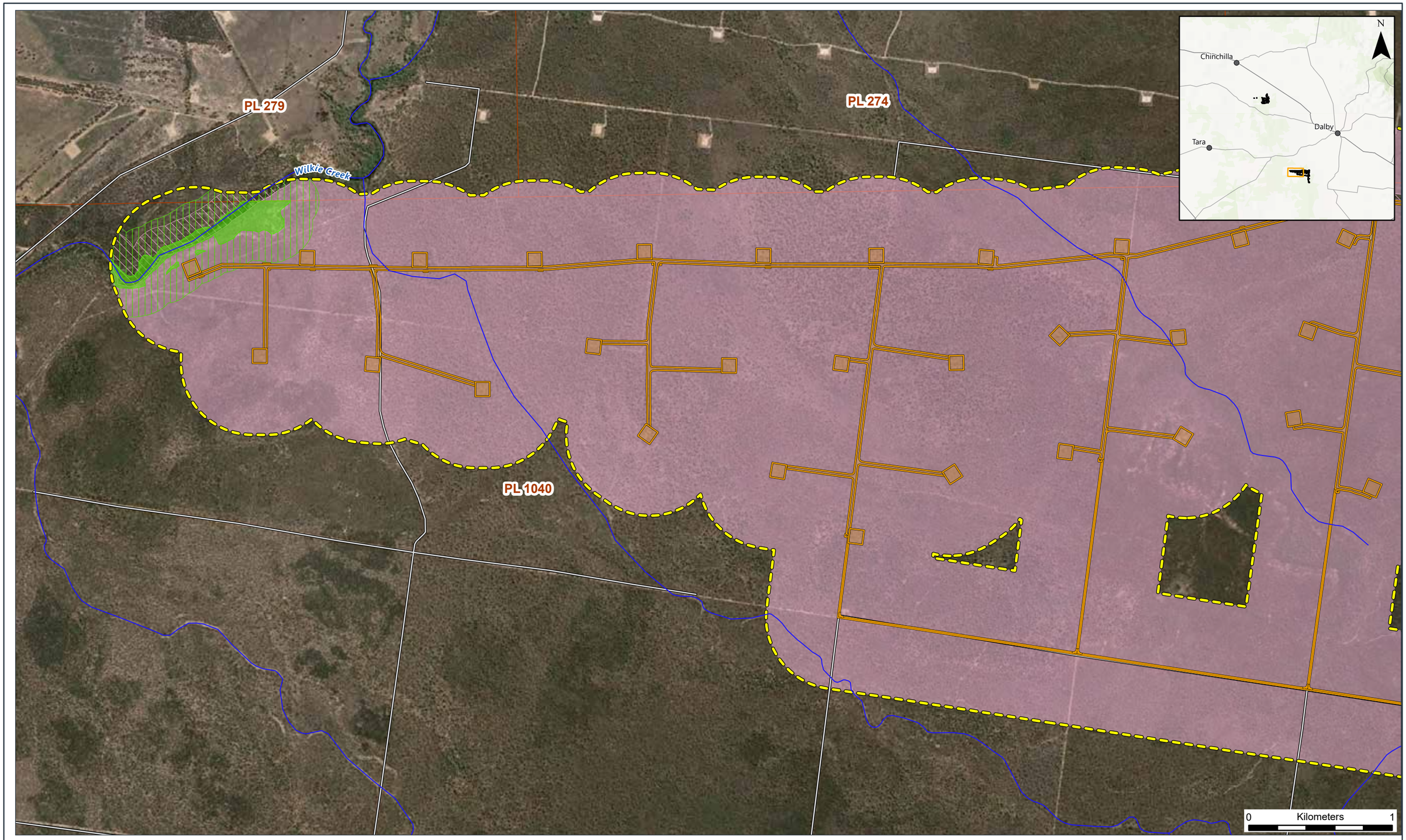

Environmentally Sensitive Areas - Category C (Page 4 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Project Footprint
- Study Area (500m Buffer)
- PL granted

ESA Category C:

- State Forest
- State Forest (200m Buffer)
- Of Concern RE
- Of Concern RE (200m Buffer)
- Essential Habitat
- Essential Habitat (200m Buffer)

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FIGURE 3.3

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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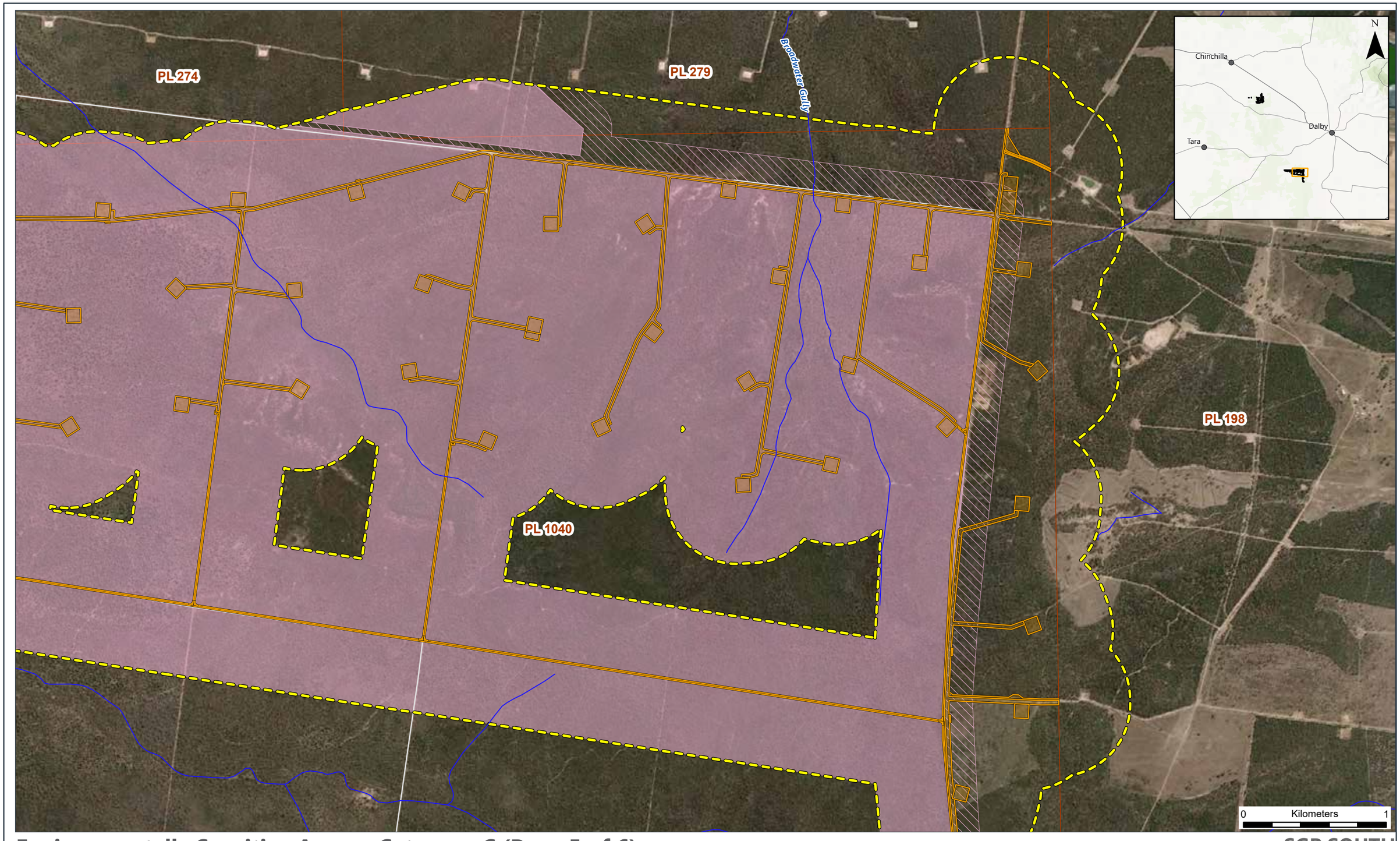

Environmentally Sensitive Areas - Category C (Page 5 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Project Footprint
- Study Area (500m Buffer)
- PL granted

ESA Category C:

- State Forest
- State Forest (200m Buffer)
- Of Concern RE
- Of Concern RE (200m Buffer)
- Essential Habitat
- Essential Habitat (200m Buffer)

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_122[C]

FIGURE 3.3

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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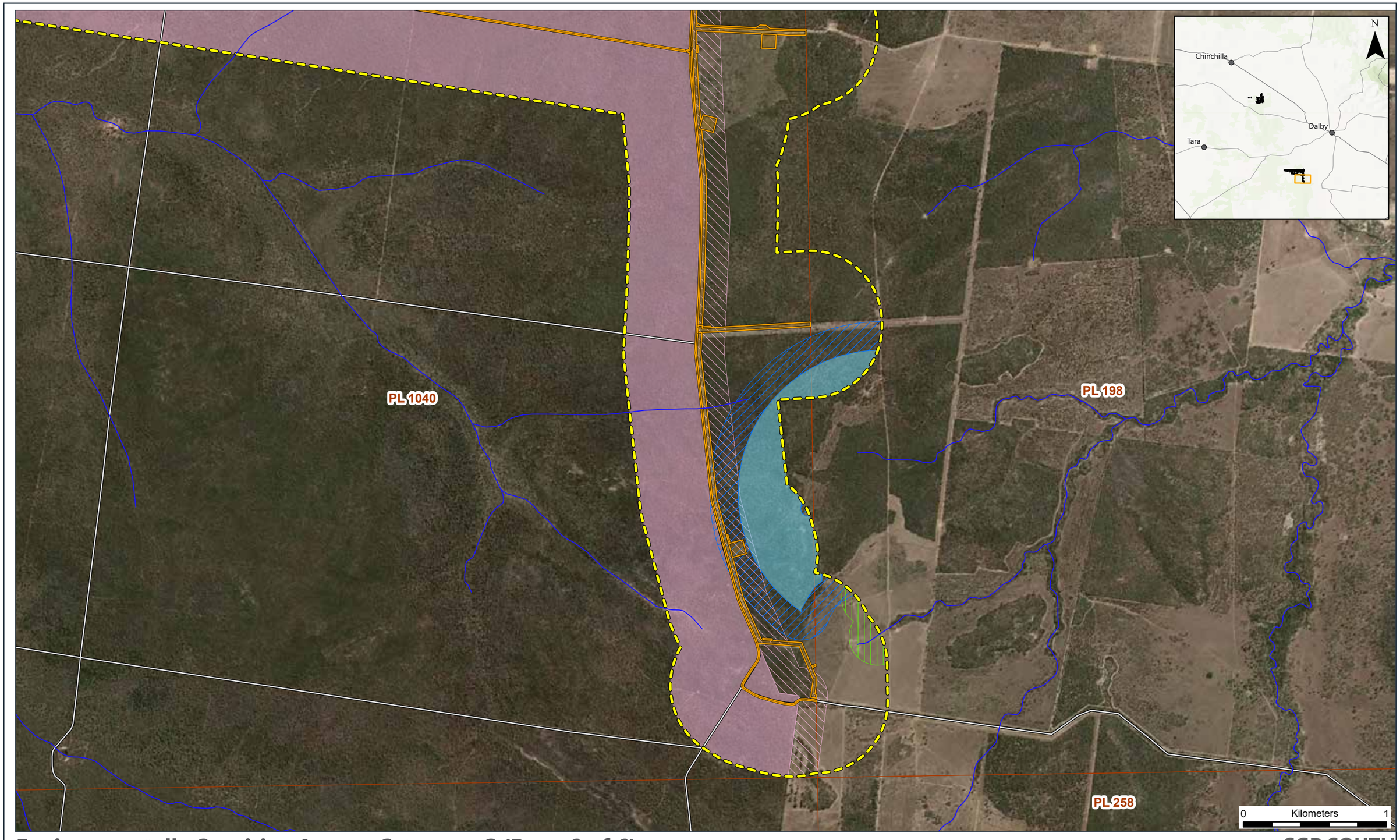

Environmentally Sensitive Areas - Category C (Page 6 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Project Footprint
- Study Area (500m Buffer)
- PL granted

ESA Category C:

- State Forest
- State Forest (200m Buffer)
- Of Concern RE
- Of Concern RE (200m Buffer)
- Essential Habitat
- Essential Habitat (200m Buffer)

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_122[C]

FIGURE 3.3

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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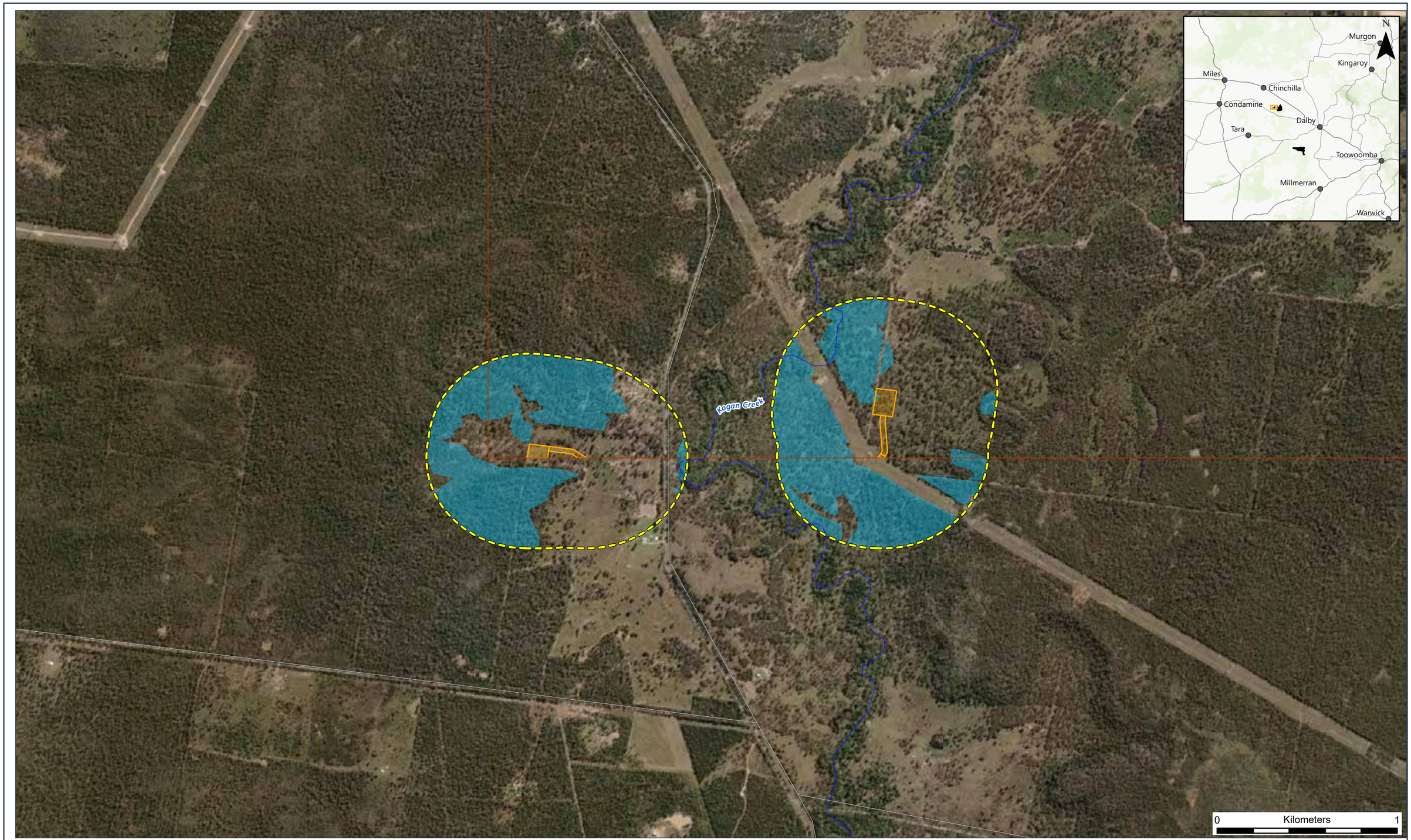

Category C Environmentally Sensitive Areas – Protected Wildlife Habitat Habitat (Page 1 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- Category C ESA – Protected Wildlife Habitat
- PL granted

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_132[C]

FIGURE 3.4

GDA2020

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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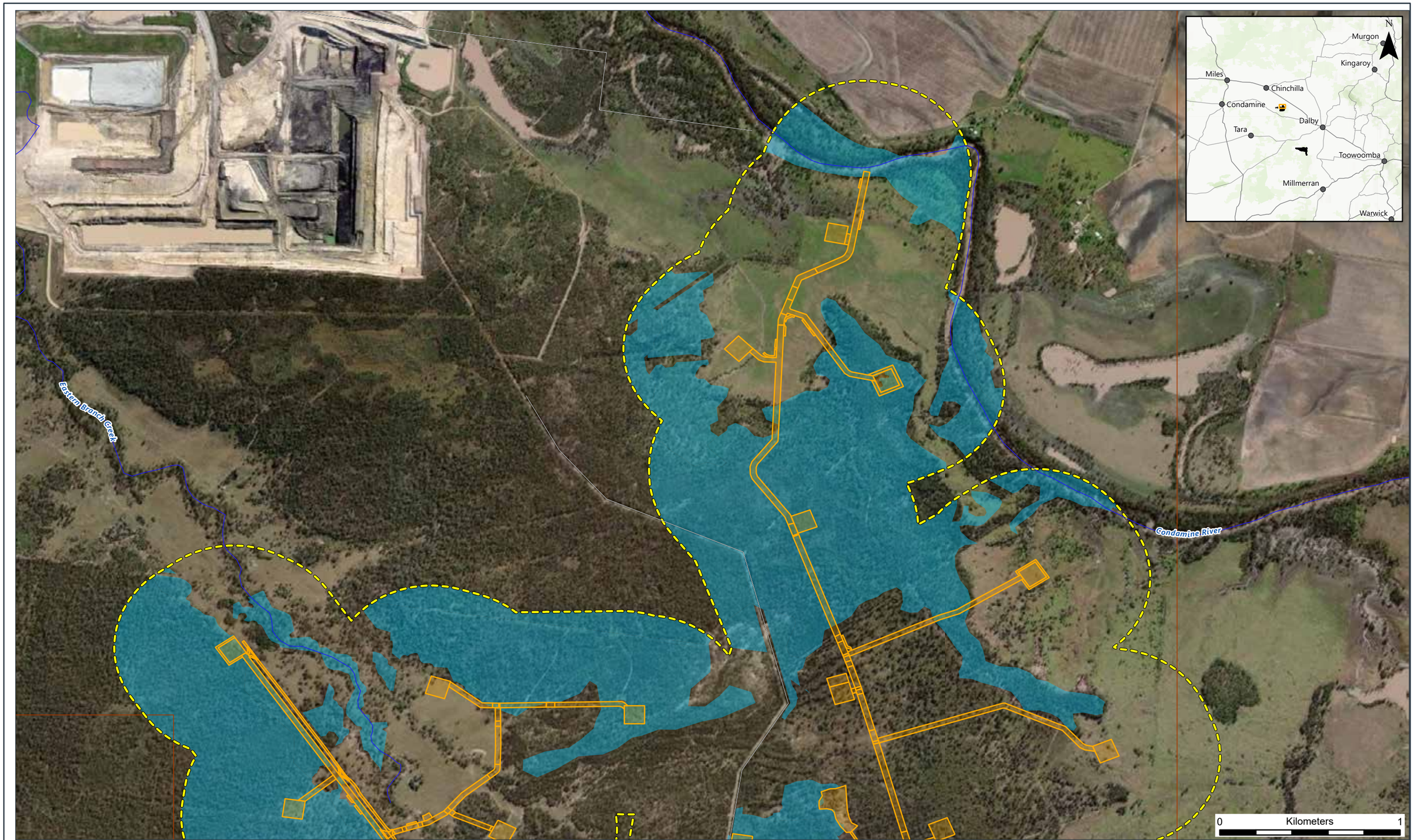

Category C Environmentally Sensitive Areas – Protected Wildlife Habitat Habitat (Page 2 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- Category C ESA – Protected Wildlife Habitat
- PL granted

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REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_132[C] | **FIGURE 3.4**

GDA2020

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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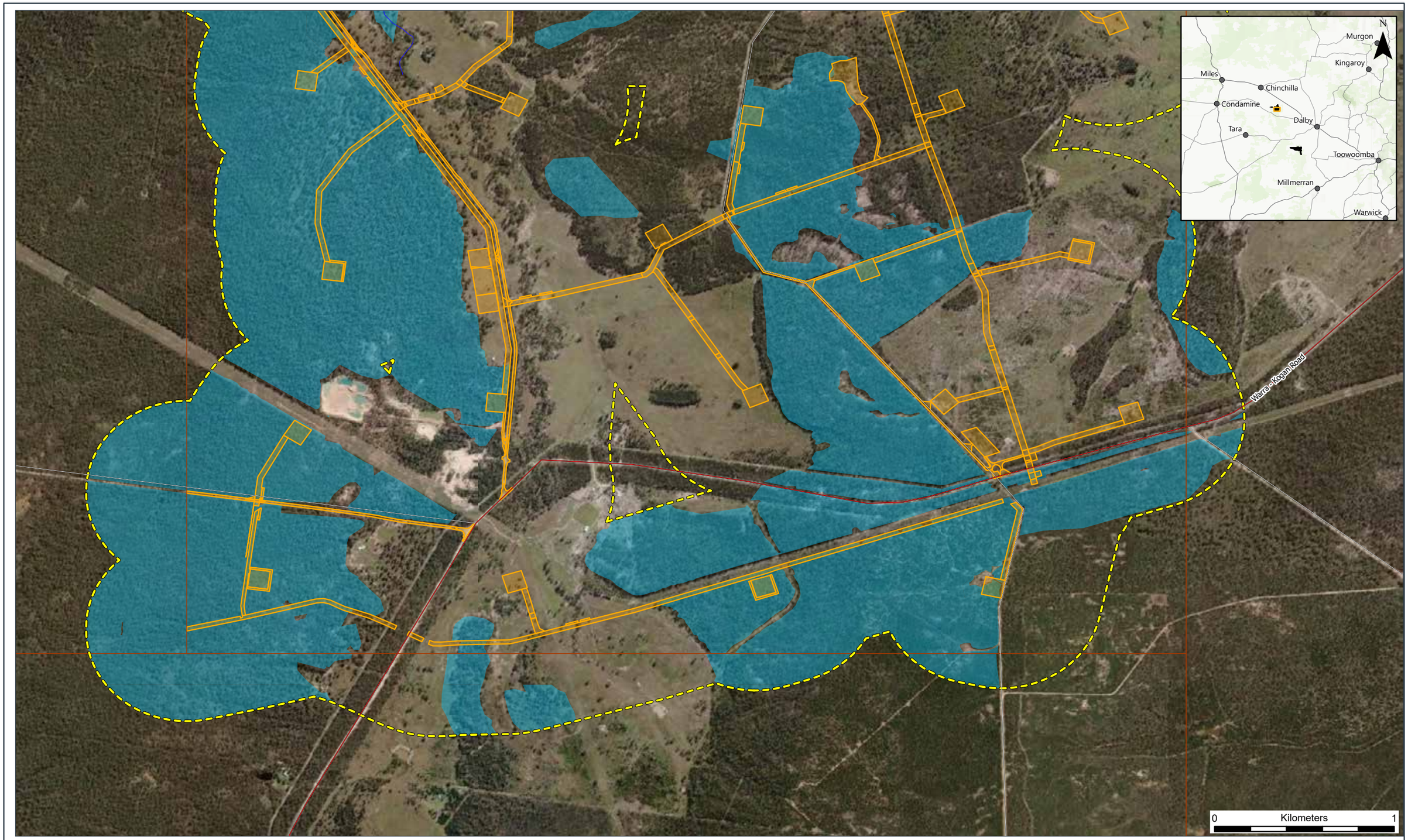

Category C Environmentally Sensitive Areas – Protected Wildlife Habitat Habitat (Page 3 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- Category C ESA – Protected Wildlife Habitat
- PL granted

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_132[C] | **FIGURE 3.4**

GDA2020

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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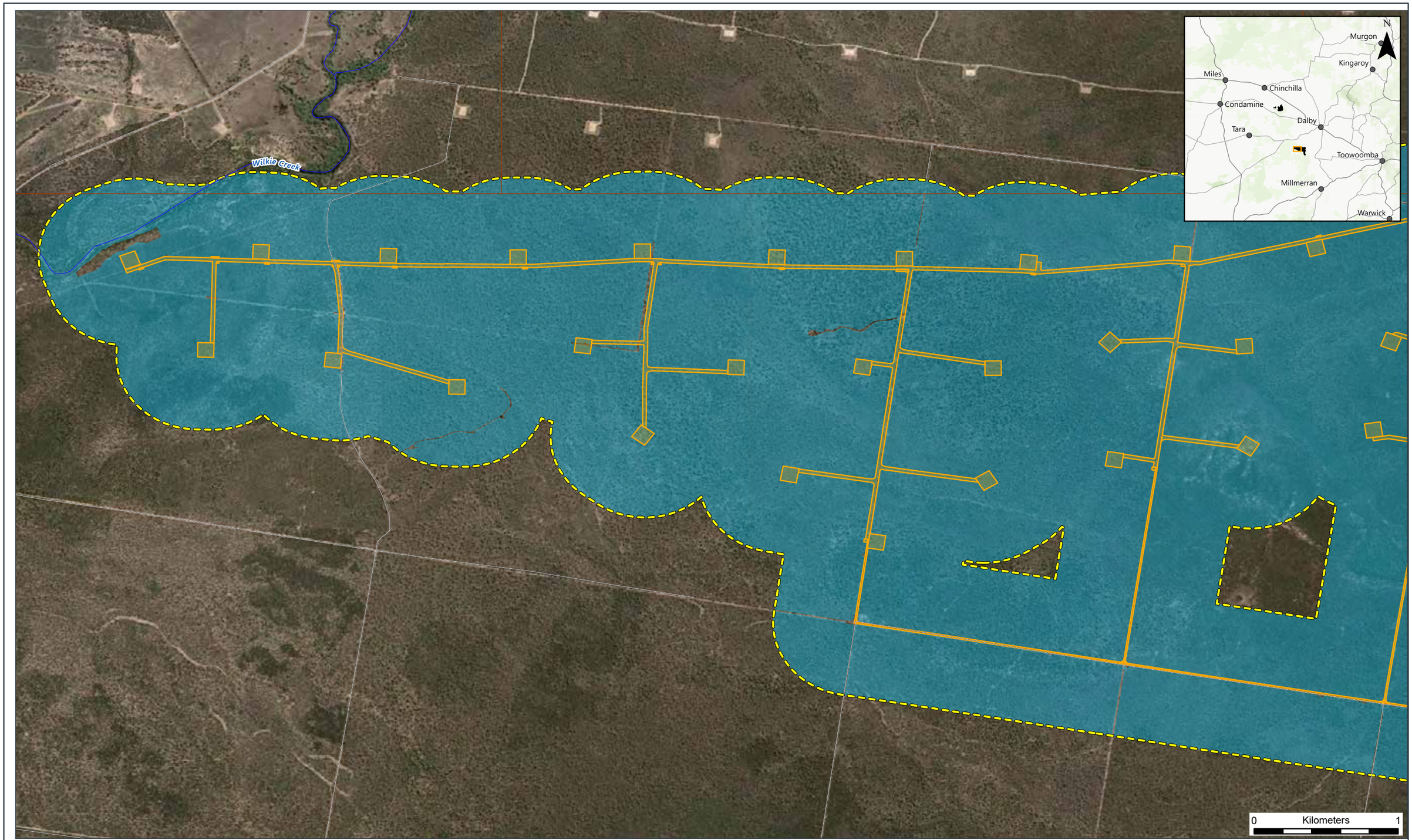

Category C Environmentally Sensitive Areas – Protected Wildlife Habitat Habitat (Page 4 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- Category C ESA – Protected Wildlife Habitat
- PL granted

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_132[C]

FIGURE 3.4

GDA2020

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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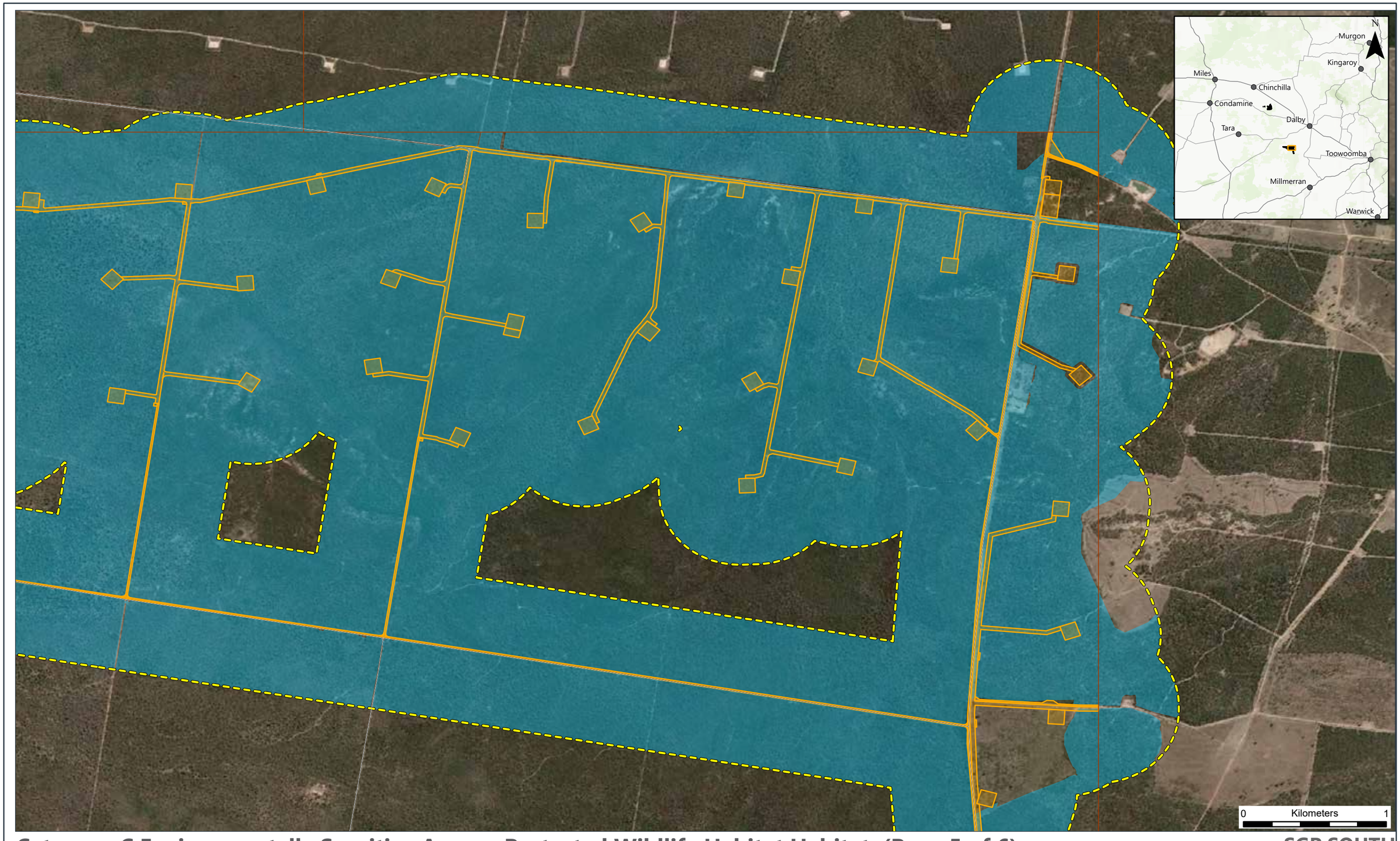

Category C Environmentally Sensitive Areas – Protected Wildlife Habitat Habitat (Page 5 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- Category C ESA – Protected Wildlife Habitat
- PL granted

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_132[C] | **FIGURE 3.4**

GDA2020

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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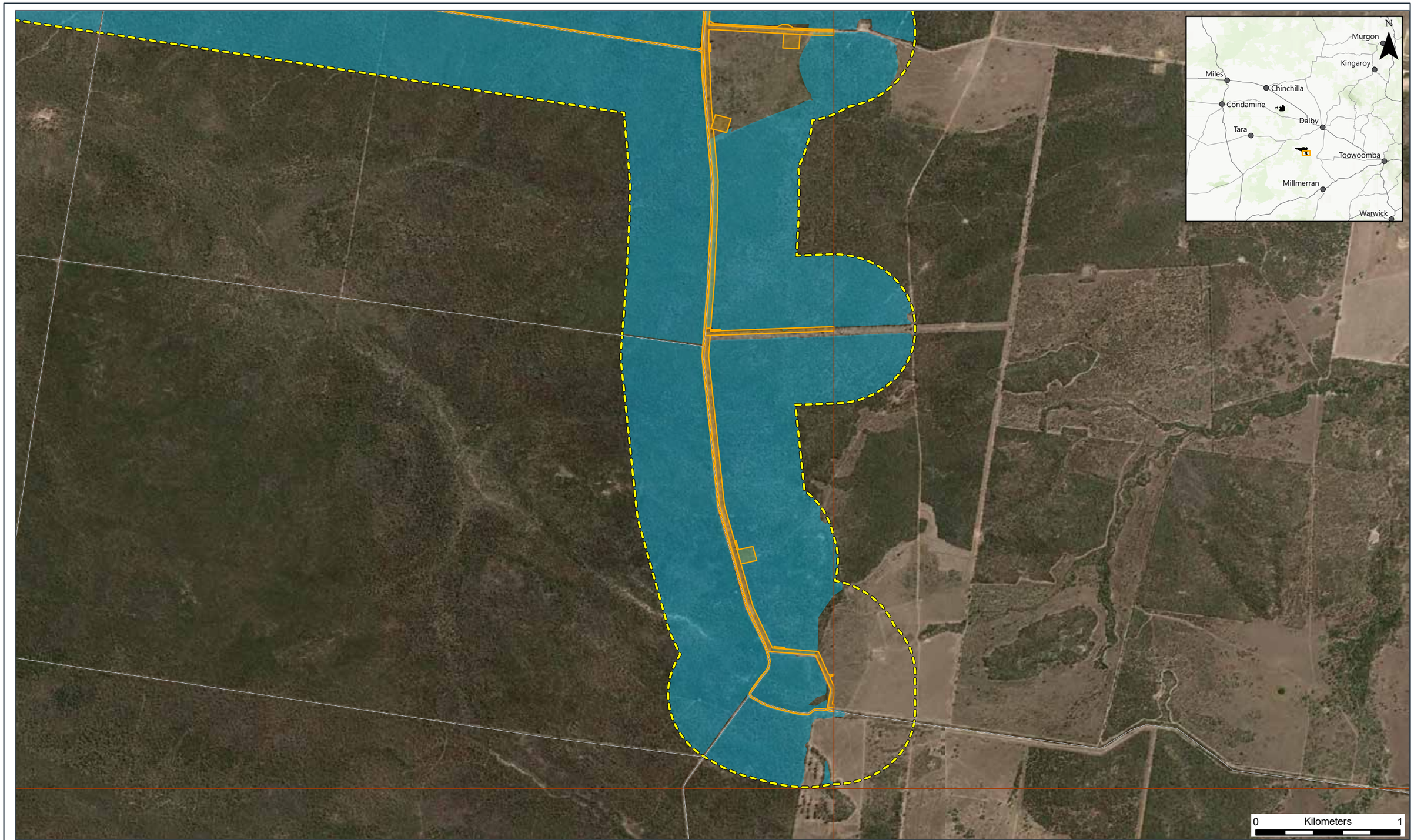

Category C Environmentally Sensitive Areas – Protected Wildlife Habitat Habitat (Page 6 of 6)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- Category C ESA – Protected Wildlife Habitat
- PL granted

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_132[C]

FIGURE 3.4

GDA2020

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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3.2 Description of environmental values – terrestrial flora

3.2.1 Vegetation communities

The Study area retains significant native vegetation cover compared with other parts of the Brigalow Belt bioregion, with approximately 77% of the total land area (6,045 ha) supporting remnant native vegetation.

Current vegetation mapping prepared by the Department of Resources (DoR) identifies 15 REs within the Study area (refer **Figure 3.5**). Descriptions and total areas of these mapped REs have been provided in **Table 3.2** and include:

- 1 classified as 'Endangered';
- 5 classified as 'Of concern'; and
- 9 classified as 'Least concern'.

Table 3.2 State Regional Ecosystem mapping by Biodiversity Status (Source: DoR, 2024)

Land zone	RE type	Description	Occurrence in Study area (ha)
Not of concern at present			
3 – Quaternary alluvial plains	11.3.18	Eucalyptus populnea and/or E. melanophloia woodland. Other canopy species include *Callitris glaucophylla*, *E. crebra*, *E. chloroclada* and *Angophora leiocarpa*. A secondary tree or shrub layer may occur, including *Allocasuarina luehmannii*, *Callitris glaucophylla*, *Geijera parviflora, Eremophila mitchellii* and *Alstonia constricta*. The ground layer is usually dominated by perennial grasses, including *Bothriochloa decipiens, Enteropogon acicularis, Triraphis mollis, Eragrostis lacunaria* and *Aristida* spp. Occurs on levees, higher alluvial plains and terraces associated with drainage lines. The soils are mainly deep, uniform red sands, or deep, texture contrast soils with a sandy, thick surface horizon overlying neutral, blocky to massive subsoil's. Small areas occur on red massive earths and alluvial soils. Not a Wetland.	7.5
5 – Tertiary-early Quaternary loamy and sandy plains and plateaus	11.5.1	*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces.	955.4
	11.5.1a	*Eucalyptus populnea* woodland with *Allocasuarina luehmannii* low tree layer. Occurs on flat to gently undulating plains formed from weathered sandstones. Duplex soils with sandy surfaces.	216.5
	11.5.4	*Eucalyptus chloroclada*, *Callitris glaucophylla*, *C. endlicheri*, *Angophora leiocarpa* woodland on Cainozoic sand plains and/or remnant surfaces.	831.5
	11.5.4a	*Callitris glaucophylla* +/- *Eucalyptus* spp. and *Corymbia* spp. woodland. Occurs on Cainozoic plains with deep sandy soils. Not a Wetland.	1825.9

Land zone	RE type	Description	Occurrence in Study area (ha)
	11.5.20	*Eucalyptus moluccana* or *E. microcarpa* or *E. woollsiana* woodland to open forest. Species such as *Allocasuarina luehmannii* and *Callitris glaucophylla* often form a secondary tree layer. Occurs on flat to gently undulating plains formed from Cainozoic/Quaternary sediments. Soils are mainly texture contrast with sandy surfaces. Not a Wetland.	545.0
7 – Cainozoic duricrusts	11.7.4	*Eucalyptus decorticans* and/or *Eucalyptus* spp., *Corymbia* spp., *Acacia* spp., *Lysicarpus angustifolius* woodland on Cainozoic lateritic duricrust.	852.6
	11.7.5	Shrubland on natural scalds on deeply weathered coarse-grained sedimentary rocks. Characteristic genera include *Calytrix* spp., *Hakea* spp., *Kunzea* spp. *Micromyrtus* spp., *Acacia* spp., *Melaleuca* spp. and (in the ground layer) *Triodia* spp.	108.9
	11.7.7	*Eucalyptus fibrosa* subsp. *nubilis* +/- *Corymbia* spp. +/- *Eucalyptus* spp. woodland on Cainozoic lateritic duricrust.	594.7
Of concern			
3 – Quaternary alluvial plains	11.3.2	*Eucalyptus populnea* woodland to open woodland. Occasionally *E. melanophloia* or *E. crebra* may be present. The ground layer is dominated by a range of tussock grasses, including *Chloris* spp., *Enteropogon* spp. and *Aristida* spp. Occurs on Cainozoic alluvial plains with variable soil types.	21.8
	11.3.3	*Eucalyptus coolabah* woodland to open woodland. A secondary tree or shrub layer may occur, including *E. populnea, Melaleuca bracteata, Acacia stenophylla, Alectryon oleifolius, Terminalia oblongata* (in the north), *Acacia pendula, A. cambagei* and *Duma florulenta*. The ground layer is dominated by a range of grass and forb species depending on season. Occurs on Cainozoic alluvial plains or levees with clay or sometimes texture contrast soils. Not a Wetland.	3.1
	11.3.4	*Eucalyptus tereticornis* woodland to open forest on Cainozoic alluvial plains. Other tree species that may be present include *E. camaldulensis*, *Corymbia tessellaris*, *C. clarksoniana*, *E. melanophloia*, *E. platyphylla* or *Angophora floribunda*. A shrub layer is usually absent and a grassy ground layer is prominent.	9.3
	11.3.17	*Eucalyptus populnea* woodland with *Casuarina cristata* and/or *Acacia harpophylla* clumps or scattered trees and a low tree layer dominated by *Geijera parviflora*. A shrub layer usually occurs, including *Eremophila mitchellii, Geijera parviflora, Acacia melvillei* (Darling Downs), *Alectryon oleifolius* and *Acacia pendula*. Localised areas may be dominated by *Acacia harpophylla* or other understorey species. A lower shrub layer commonly occurs. The ground layer is dominated by tussock grasses, including *Bothriochloa decipiens, Aristida ramosa,*	3.0

Land zone	RE type	Description	Occurrence in Study area (ha)
		Enteropogon acicularis and *Paspalidium* spp. with *Chloris ventricosa, Eragrostis lacunaria, Aristida jerichoensis, Paspalidium constrictum,* and *Tripogon loliiformis* on scalded areas. Occurs on back plains, levees and terraces formed on Quaternary alluvial deposits. Soils are generally deep texture contrast with thin sandy surfaces. Not a Wetland.	
	11.3.25	*Eucalyptus tereticornis* or *E. camaldulensis* woodland to open forest on fringing levees and banks of major rivers and drainage lines of alluvial plains. Other tree species, including *Casuarina cunninghamiana*, *E. coolabah*, *Melaleuca bracteata*, *M. viminalis*, *Livistona* spp. (in the north), *Melaleuca* spp. and *Angophora floribunda* may occur.	44.3
Endangered			
4 – Tertiary-early Quaternary clay plains	11.4.3	*Acacia harpophylla* and/or *Casuarina cristata* shrubby open forest on Cainozoic clay plains	7.5
		Total remnant	**6,045.0**

State RE Mapping (Page 1 of 6)

SGP SOUTH

- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint

Vegetation Management Regional Ecosystem (Biodiversity Status):

- Endangered - Dominant Vegetation
- Endangered - Sub-dominant Vegetation
- Of Concern - Dominant Vegetation
- Of Concern - Sub-dominant Vegetation
- No concern at present
- Non-remnant vegetation, cultivated or built environment

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FIGURE 3.5

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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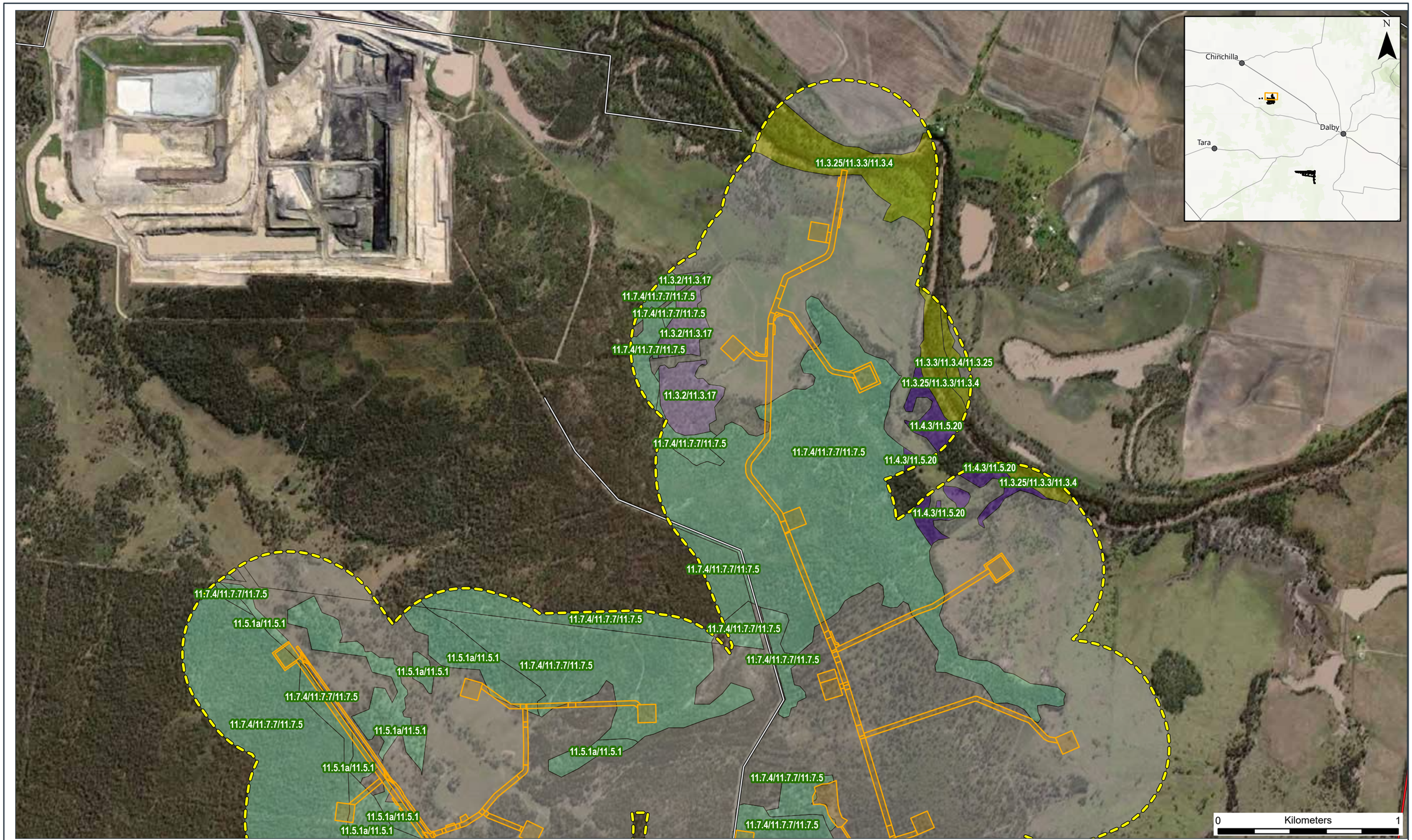

State RE Mapping (Page 2 of 6)

SGP SOUTH

- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint

Vegetation Management Regional Ecosystem (Biodiversity Status):

- Endangered - Dominant Vegetation
- Endangered - Sub-dominant Vegetation
- Of Concern - Dominant Vegetation
- Of Concern - Sub-dominant Vegetation
- No concern at present
- Non-remnant vegetation, cultivated or built environment

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 10/03/2025 | **DWG No:** ARR-002_123[C]

FIGURE 3.5

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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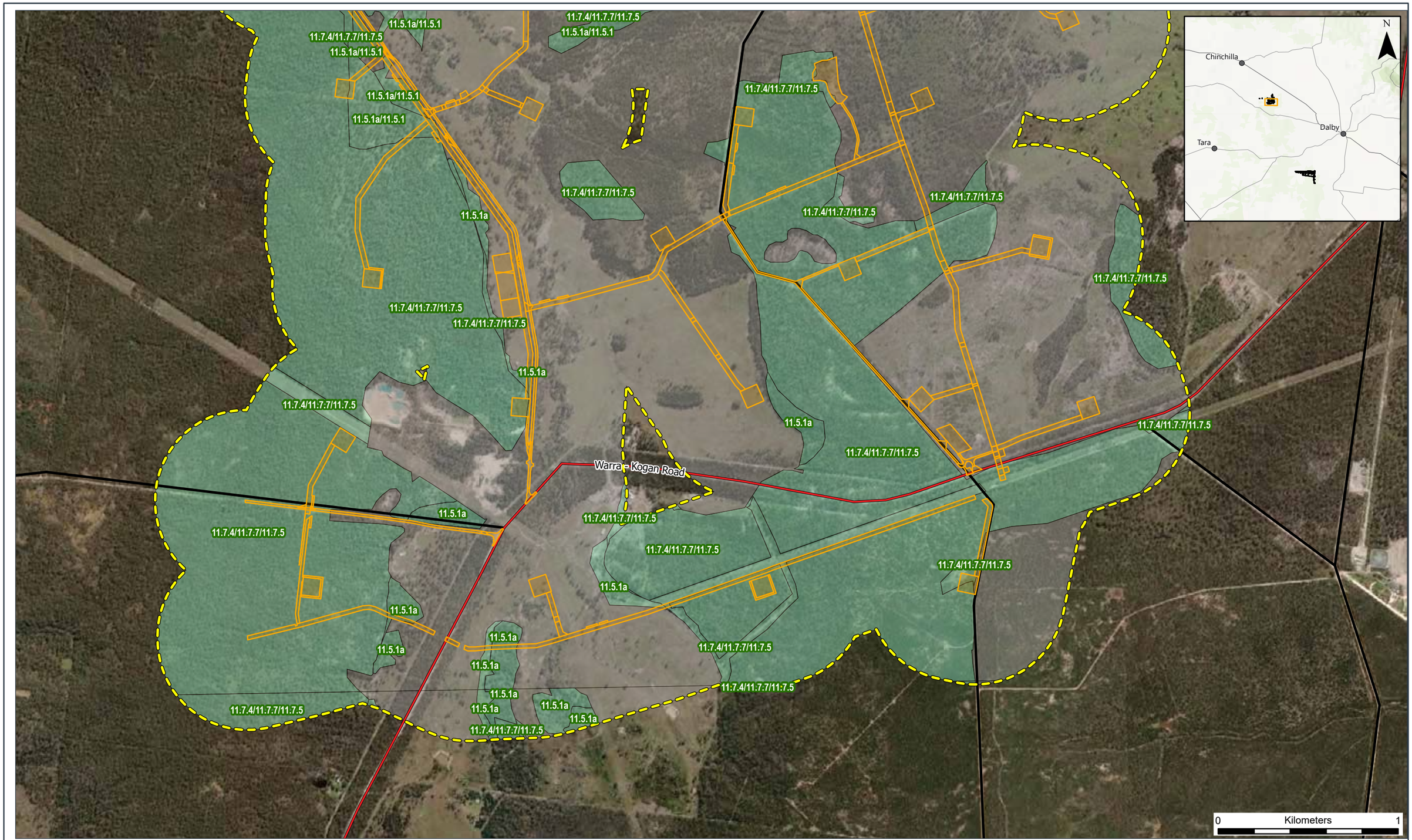

State RE Mapping (Page 3 of 6)

SGP SOUTH

- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint

Vegetation Management Regional Ecosystem (Biodiversity Status):

- Endangered - Dominant Vegetation
- Endangered - Sub-dominant Vegetation
- Of Concern - Dominant Vegetation
- Of Concern - Sub-dominant Vegetation
- No concern at present
- Non-remnant vegetation, cultivated or built environment

Attexo

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FIGURE 3.5

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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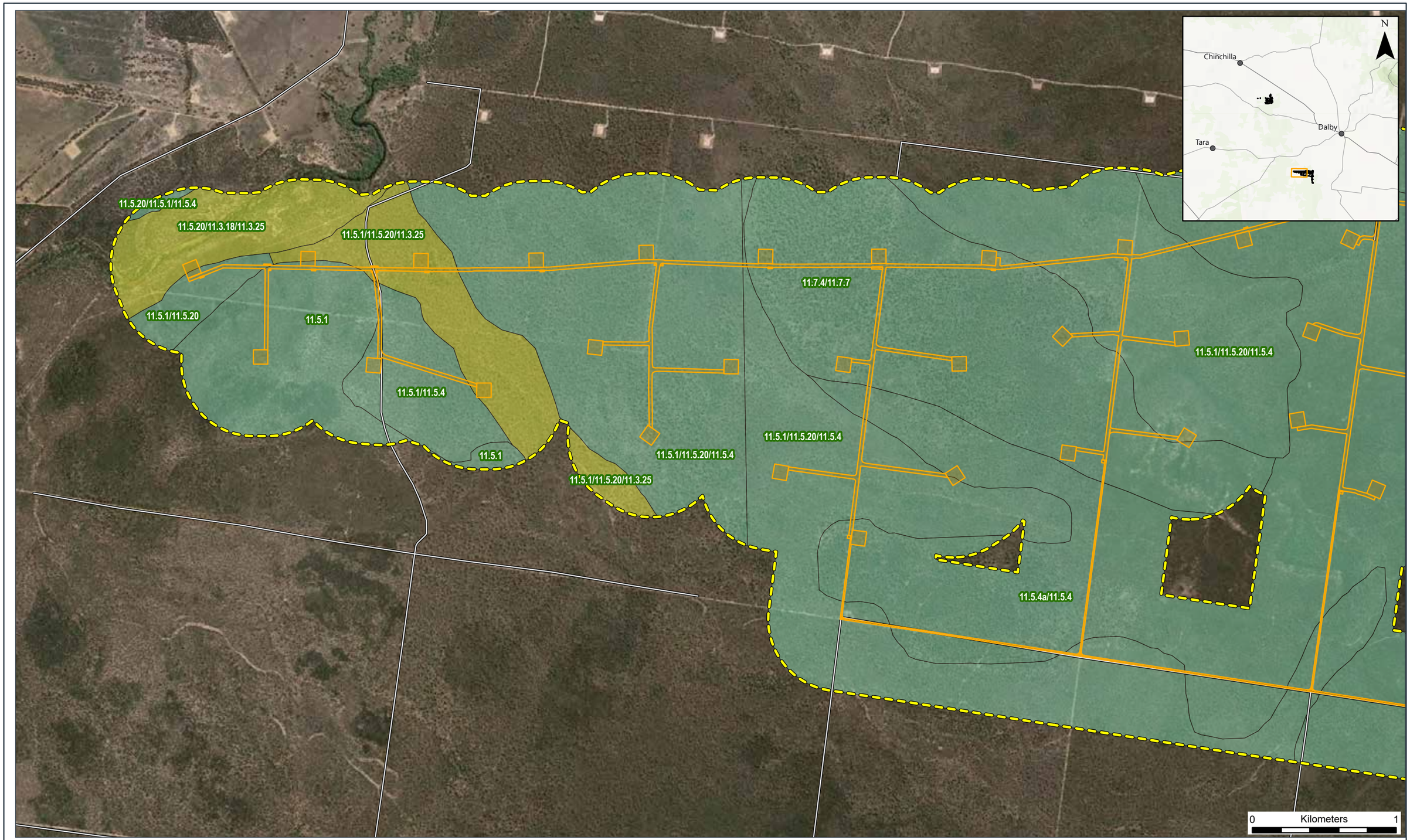

State RE Mapping (Page 4 of 6)

SGP SOUTH

- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint

Vegetation Management Regional Ecosystem (Biodiversity Status):

- Endangered - Dominant Vegetation
- Endangered - Sub-dominant Vegetation
- Of Concern - Dominant Vegetation
- Of Concern - Sub-dominant Vegetation
- No concern at present
- Non-remnant vegetation, cultivated or built environment

Attexo

REVIEWED: JC **DRAWN:** JT **SCALE (A3):** 1:25,000 **DATE:** 10/03/2025 **DWG No:** ARR-002_123[C] **FIGURE 3.5**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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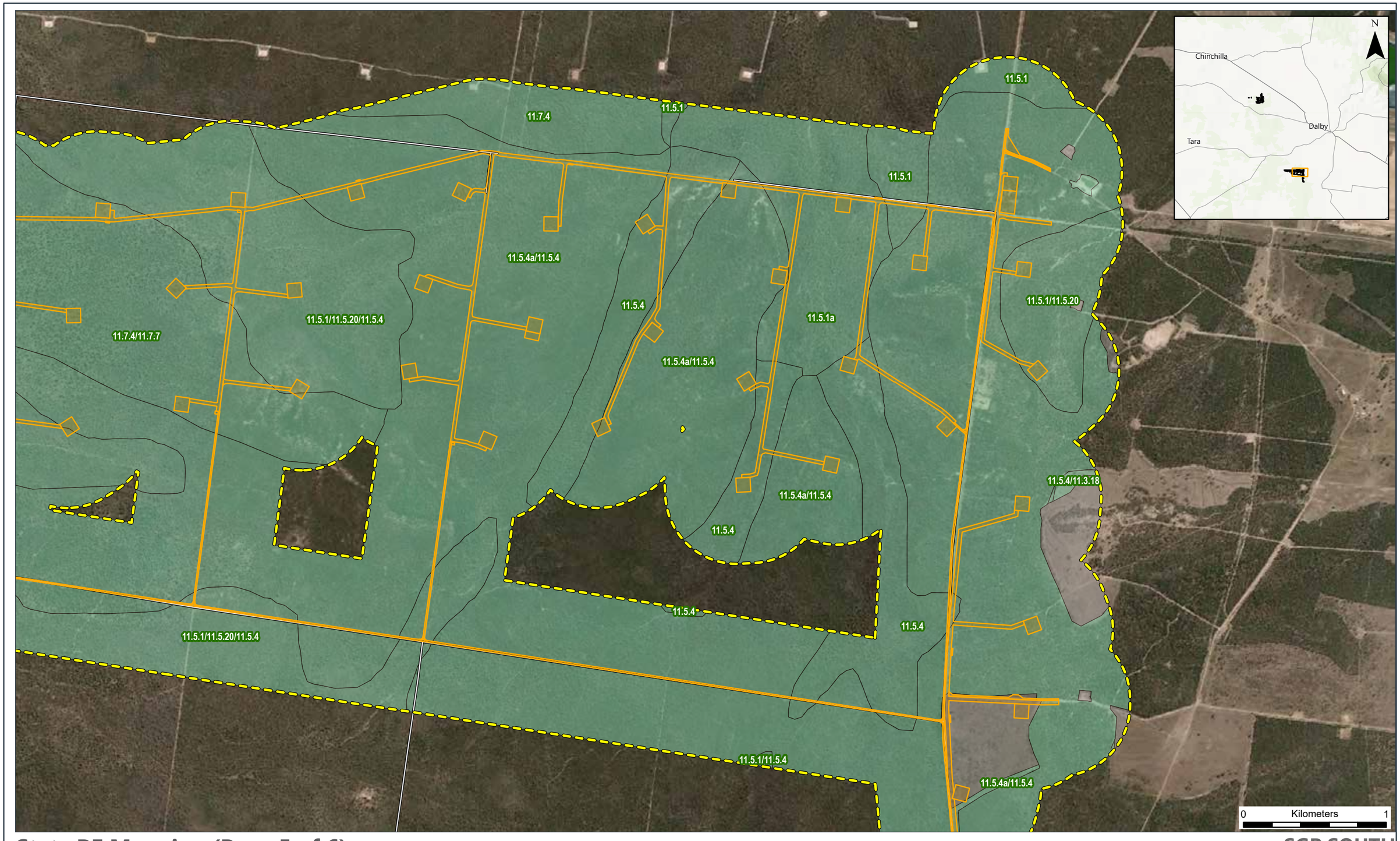

State RE Mapping (Page 5 of 6)

SGP SOUTH

- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint

Vegetation Management Regional Ecosystem (Biodiversity Status):

- Endangered - Dominant Vegetation
- Endangered - Sub-dominant Vegetation
- Of Concern - Dominant Vegetation
- Of Concern - Sub-dominant Vegetation
- No concern at present
- Non-remnant vegetation, cultivated or built environment

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 10/03/2025 | **DWG No:** ARR-002_123[C]

FIGURE 3.5

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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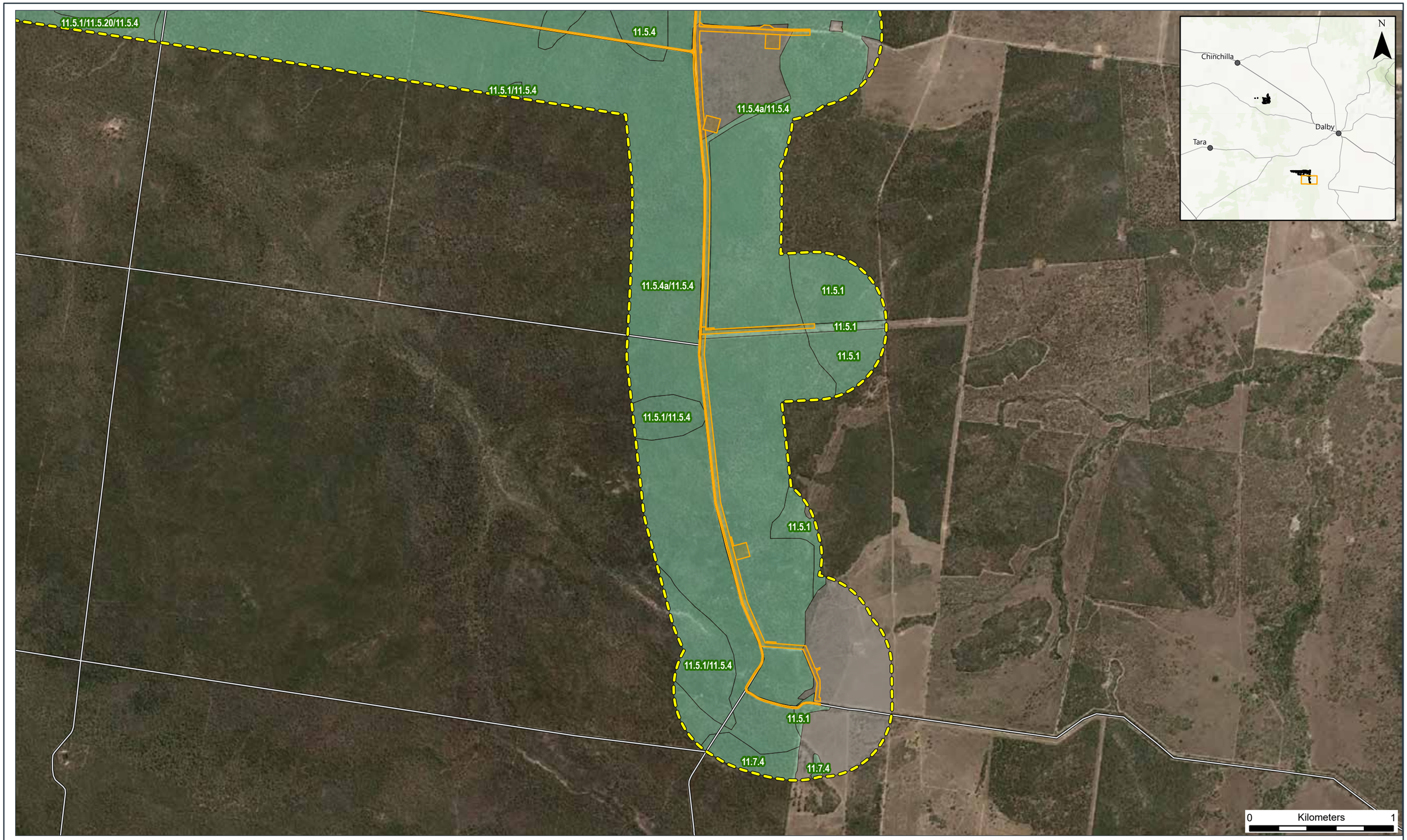

State RE Mapping (Page 6 of 6)

SGP SOUTH

- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint

Vegetation Management Regional Ecosystem (Biodiversity Status):

- Endangered - Dominant Vegetation
- Endangered - Sub-dominant Vegetation
- Of Concern - Dominant Vegetation
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FIGURE 3.5

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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3.2.1.1 Field-verified Regional Ecosystems

GTRE mapping prepared for the Study area is based on Project-specific vegetation community surveys as described in **Section 2.2**, with the mapping shown in **Figure 3.6** (shown by Biodiversity Status).

Of the 15 REs originally mapped by the DoR for the Study area, RE 11.3.17 was not recorded during the field survey (refer to **Table 3.3**). Of the 17 GTREs recorded during the field survey, three were not mapped by DoR (RE 11.3.1, 11.3.14, and 11.3.27f).

Table 3.3 Ground-truthed Regional Ecosystems by Biodiversity Status (source: Arrow 2024)

Land zone	RE type	Description	Occurrence in Study area (ha)
No concern at present			
3 – Quaternary alluvial plains	11.3.14	*Angophora floribunda*, *A. leiocarpa*, *Eucalyptus tereticornis* and *E. chloroclada* woodland with a secondary tree layer dominated by *Callitris glaucophylla* or *Allocasuarina leuhmanii*. Occurs on Cainozoic alluvial soils.	15.5
	11.3.18	*Eucalyptus populnea, Callitris glaucophylla, Allocasuarina luehmannii* shrubby woodland on alluvium	2.7
5 – Tertiary-early Quaternary loamy and sandy plains and plateaus	11.5.1	*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces.	1435.3
	11.5.1a	*Eucalyptus populnea* woodland with *Allocasuarina luehmannii* low tree layer. Occurs on flat to gently undulating plains formed from weathered sandstones. Duplex soils with sandy surfaces.	84.2
	11.5.4	*Eucalyptus chloroclada, Callitris glaucophylla, C. endlicheri, Angophora leiocarpa* woodland on Cainozoic sand plains and/or remnant surfaces	622.0
	11.5.4a	*Callitris glaucophylla* +/- *Eucalyptus* spp. and *Corymbia* spp. woodland. Occurs on Cainozoic plains with deep sandy soils.	29.7
	11.5.20	*Eucalyptus moluccana* and/or *E. microcarpa* and/or E. woollsiana ± *E. crebra* woodland on Cainozoic sand plains.	415.3
7 – Cainozoic duricrusts	11.7.4	*Eucalyptus decorticans* and/or *Eucalyptus* spp., *Corymbia* spp., *Acacia* spp., *Lysicarpus angustifolius* woodland on Cainozoic lateritic duricrust.	2759.8
	11.7.5	Shrubland on natural scalds on deeply weathered coarse-grained sedimentary rocks. Characteristic genera include *Calytrix* spp., *Hakea* spp., *Kunzea* spp. *Micromyrtus* spp., *Acacia* spp., *Melaleuca* spp. and (in the ground layer) *Triodia* spp.	27.1
	11.7.7	*Eucalyptus fibrosa* subsp. *nubilis* +/- *Corymbia* spp. +/- *Eucalyptus* spp. woodland on Cainozoic lateritic duricrust.	567.6

Land zone	RE type	Description	Occurrence in Study area (ha)
Of concern			
3 – Quaternary alluvial plains	11.3.2	*Eucalyptus populnea* woodland to open woodland. Occasionally *E. melanophloia* or *E. crebra* may be present. The ground layer is dominated by a range of tussock grasses, including *Chloris* spp., *Enteropogon* spp. and *Aristida* spp.	5.0
	11.3.3	*Eucalyptus coolabah* woodland to open woodland. A secondary tree or shrub layer may occur, *including E. populnea, Melaleuca bracteata, Acacia stenophylla, Alectryon oleifolius, Terminalia oblongata* (in the north), *Acacia pendula, A. cambagei* and *Duma florulenta*. The ground layer is dominated by a range of grass and forb species depending on season. Occurs on Cainozoic alluvial plains or levees with clay or sometimes texture contrast soils.	3.0
	11.3.4	*Eucalyptus tereticornis* woodland to open forest on Cainozoic alluvial plains. Other tree species that may be present include *E. camaldulensis*, *Corymbia tessellaris*, *C. clarksoniana*, *E. melanophloia*, *E. platyphylla* or *Angophora floribunda*..	69.3
	11.3.25	*Eucalyptus tereticornis* or *E. camaldulensis* woodland to open forest on fringing levees and banks of major rivers and drainage lines of alluvial plains. Other tree species, including *Casuarina cunninghamiana*, *E. coolabah*, *Melaleuca bracteata*, *M. viminalis*, *Livistona* spp. (in the north), *Melaleuca* spp. and *Angophora floribunda* may occur.	71.2
	11.3.27f	Freshwater wetlands. Vegetation is variable including open water with or without aquatic species and fringing sedgelands and eucalypt woodlands. Occurs in a variety of situations including lakes, billabongs, oxbows and depressions on floodplains.	1.6
Endangered			
3 – Quaternary alluvial plains	11.3.1	*Acacia harpophylla* and/or Casuarina cristata open forest on alluvial plains, with or without scattered emergent *Eucalyptus* spp. such as *E. coolabah*, *E. largiflorens*, *E. populnea*, *E. orgadophila* and *E. woollsiana*.	7.9
4 – Tertiary-early Quaternary clay plains	11.4.3	*Acacia harpophylla* and/or *Casuarina cristata* open forest on Cainozoic clay plains. *A. harpophylla* forms a continuous canopy with varying densities of *C. cristata*, forming part of the canopy or emerging above it. *C. cristata* may be dominant or form pure stands particularly in the south of the bioregion.	5.7
		Total (remnant)	**6,122.9**

Land zone	RE type	Description	Occurrence in Study area (ha)
Regrowth			
3 – Quaternary alluvial plains	11.3.2	*Eucalyptus populnea* woodland to open woodland. Occasionally *E. melanophloia* or *E. crebra* may be present. The ground layer is dominated by a range of tussock grasses, including *Chloris* spp., *Enteropogon* spp. and *Aristida* spp.	1.1
	11.3.25	*Eucalyptus tereticornis* or *E. camaldulensis* woodland to open forest on fringing levees and banks of major rivers and drainage lines of alluvial plains. Other tree species, including *Casuarina cunninghamiana*, *E. coolabah*, *Melaleuca bracteata*, *M. viminalis*, *Livistona* spp. (in the north), *Melaleuca* spp. and *Angophora floribunda* may occur..	0.2
4 – Tertiary-early Quaternary clay plains	11.4.3	*Acacia harpophylla* and/or *Casuarina cristata* open forest on Cainozoic clay plains. *A. harpophylla* forms a continuous canopy with varying densities of *C. cristata*, forming part of the canopy or emerging above it. *C. cristata* may be dominant or form pure stands particularly in the south of the bioregion.	12.6
5 – Tertiary-early Quaternary loamy and sandy plains and plateaus	11.5.1	*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces.	323.4
	11.5.1a	*Eucalyptus populnea* woodland with *Allocasuarina luehmannii* low tree layer. Occurs on flat to gently undulating plains formed from weathered sandstones.	1.2
	11.5.4	*Eucalyptus chloroclada, Callitris glaucophylla, C. endlicheri, Angophora leiocarpa* woodland on Cainozoic sand plains and/or remnant surfaces	23.0
7 – Cainozoic duricrusts	11.7.4	*Eucalyptus decorticans* and/or *Eucalyptus* spp., *Corymbia* spp., *Acacia* spp., *Lysicarpus angustifolius* woodland on Cainozoic lateritic duricrust.	36.8
	11.7.7	*Eucalyptus fibrosa* subsp. *nubilis* +/- *Corymbia* spp. +/- *Eucalyptus* spp. woodland on Cainozoic lateritic duricrust.	26.1
		Undifferentiated regrowth	60.1
		Total (regrowth)	**484.5**

Ground-Truthed Regional Ecosystem Mapping (Page 1 of 6)

SGP SOUTH

- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint

Ground-Truthed Regional Ecosystem (Biodiversity Status):

- Endangered
- Of Concern
- No Concern at Present
- N/A

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FIGURE 3.6

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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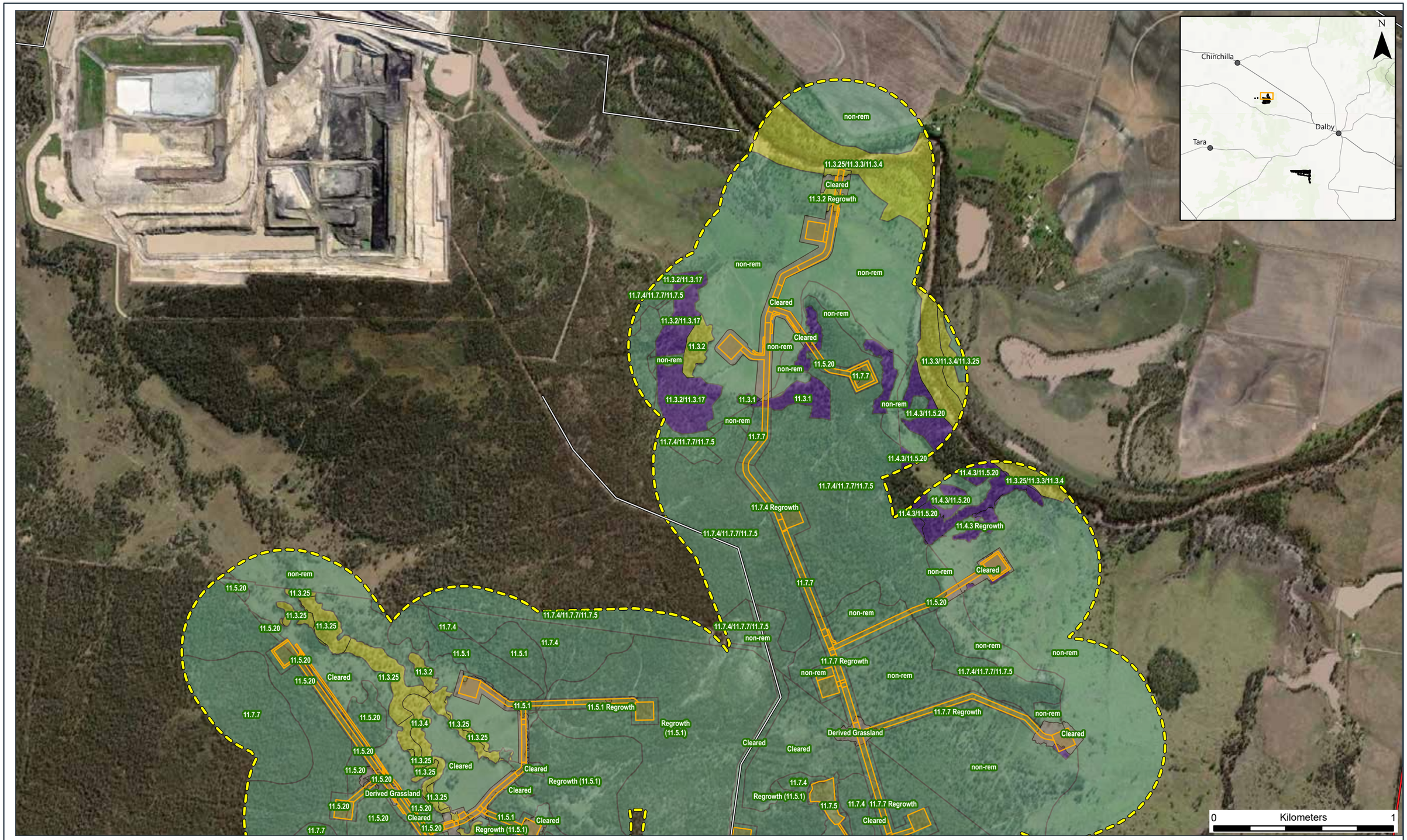

Ground-Truthed Regional Ecosystem Mapping (Page 2 of 6)

SGP SOUTH

- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint

Ground-Truthed Regional Ecosystem (Biodiversity Status):

- Endangered
- Of Concern
- No Concern at Present
- N/A

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_124[C] | **FIGURE 3.6**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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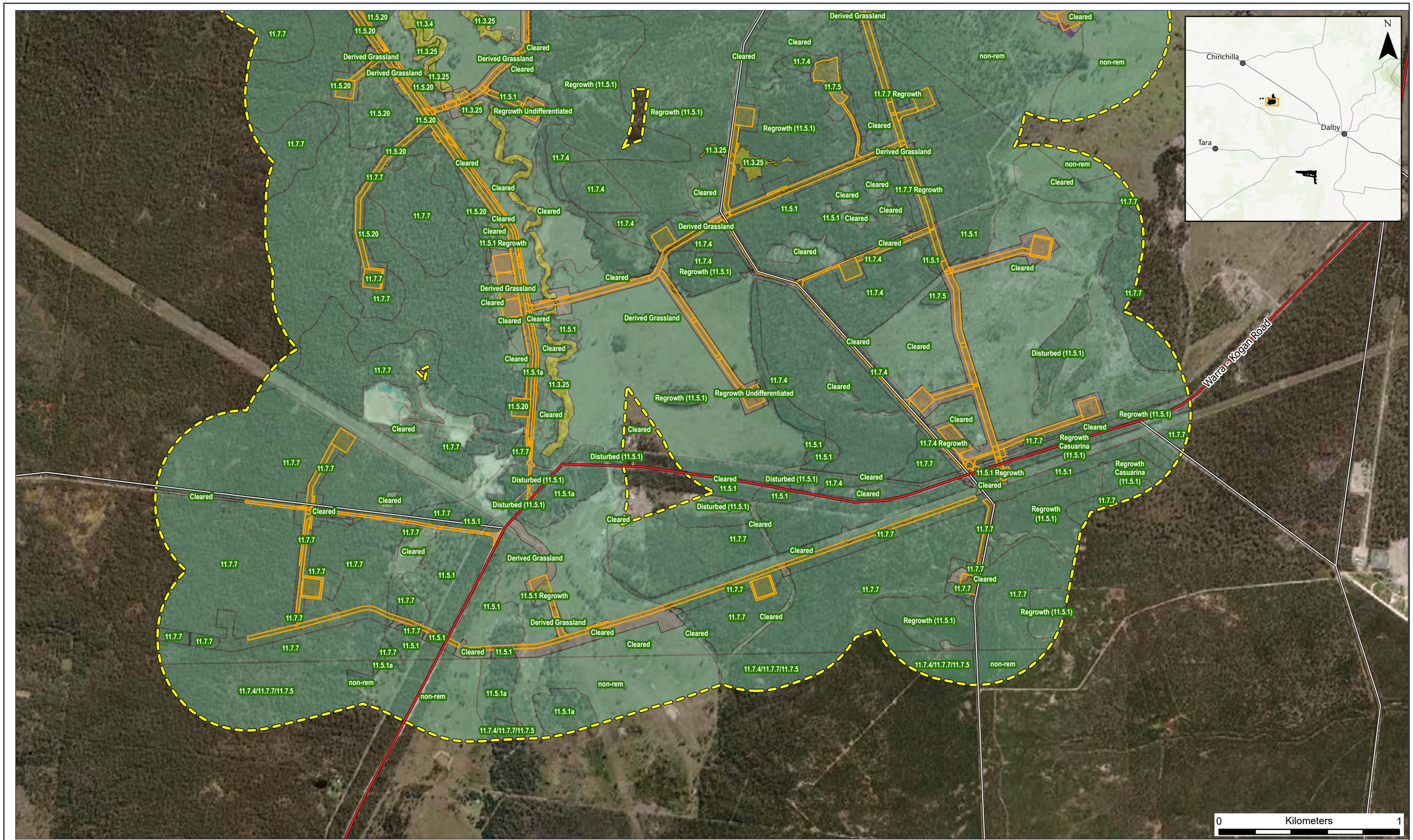

Ground-Truthed Regional Ecosystem Mapping (Page 3 of 6)

SGP SOUTH

- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint

Ground-Truthed Regional Ecosystem (Biodiversity Status):

- Endangered
- Of Concern
- No Concern at Present
- N/A

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_124[C] | **FIGURE 3.6**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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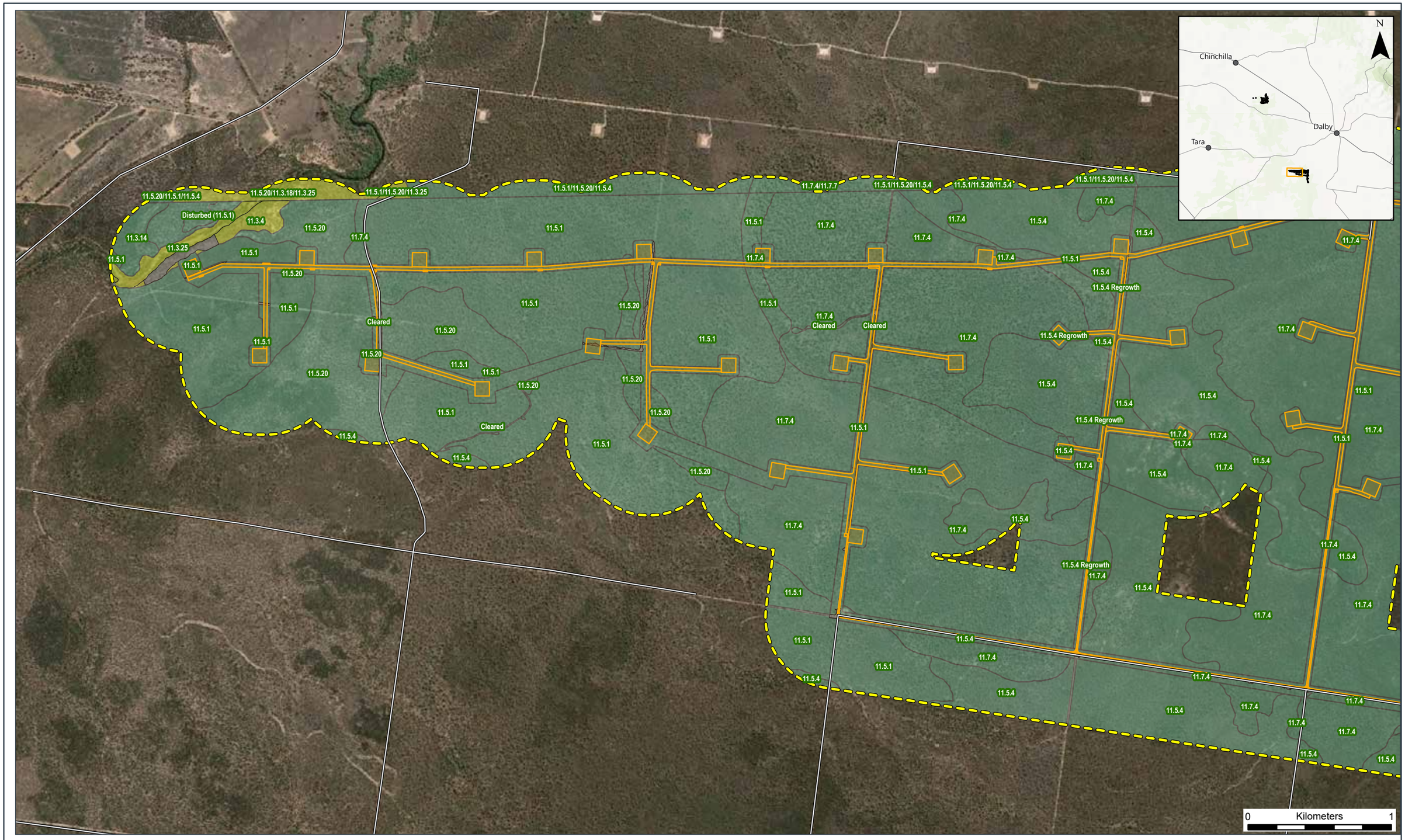

Ground-Truthed Regional Ecosystem Mapping (Page 4 of 6)

SGP SOUTH

- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- Ground-Truthed Regional Ecosystem (Biodiversity Status):
  - Endangered
  - Of Concern
  - No Concern at Present
  - N/A

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_124[C]

FIGURE 3.6

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map
World Hillshade: Esri, USGS

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Ground-Truthed Regional Ecosystem Mapping (Page 5 of 6)

SGP SOUTH

- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint

Ground-Truthed Regional Ecosystem (Biodiversity Status):

- Endangered
- Of Concern
- No Concern at Present
- N/A

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_124[C]

FIGURE 3.6

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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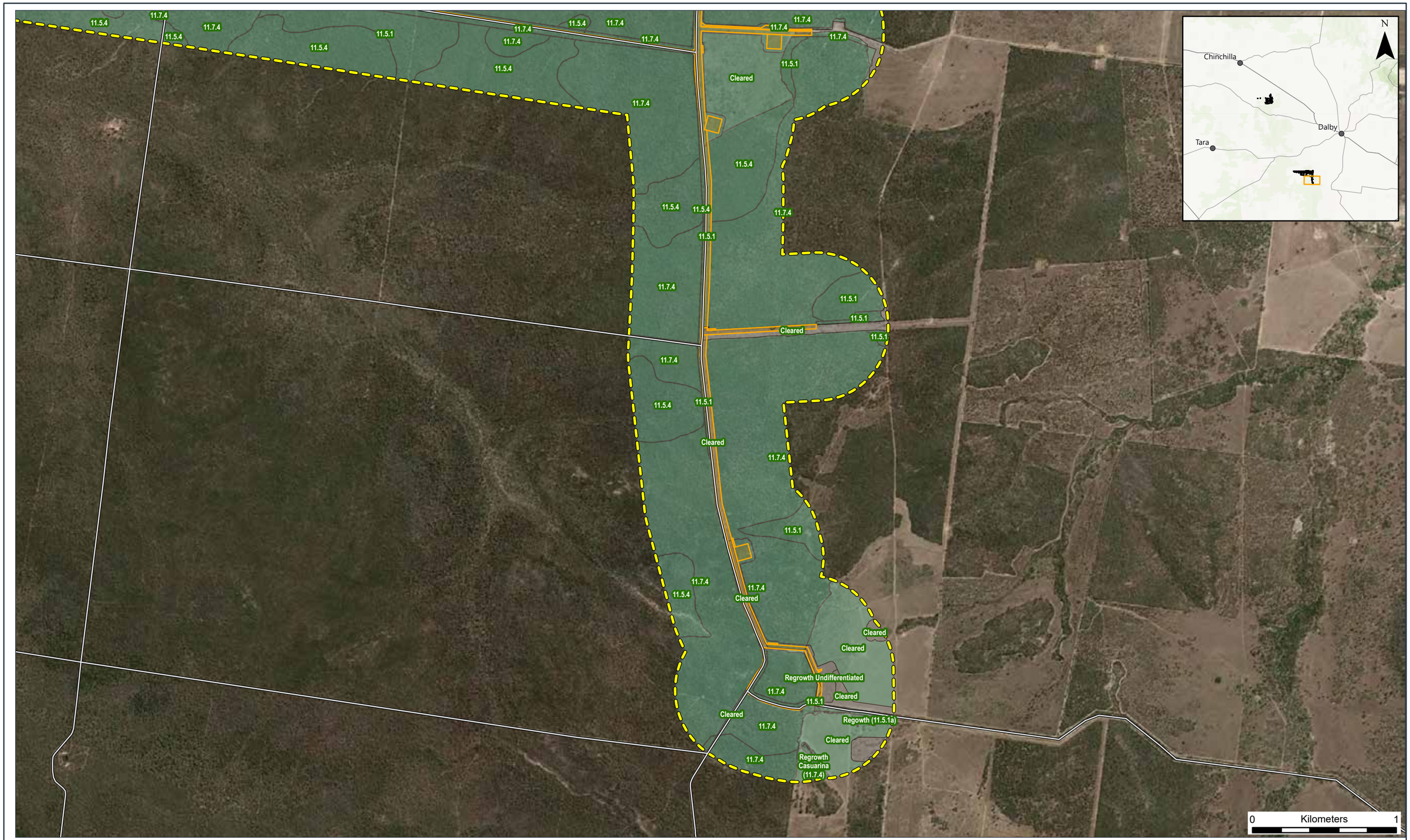

Ground-Truthed Regional Ecosystem Mapping (Page 6 of 6)

SGP SOUTH

- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint

Ground-Truthed Regional Ecosystem (Biodiversity Status):

- Endangered
- Of Concern
- No Concern at Present
- N/A

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_124[C] | **FIGURE 3.6**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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3.2.2 Protected plants trigger mapping

There are several areas shown as 'high risk' on the Protected Plants Flora Survey Trigger Map within the proposed Project footprint (refer **Figure 3.7**). They occur in both the northern and southern portions of the Study area. The survey effort in the high risk trigger mapping is described in **Section 2.2.1.1** and records of conservation-significant flora are presented in **Section 3.2.3**.

3.2.3 Conservation-significant flora

The desktop assessment identified 37 threatened and 8 near-threatened flora species listed under the NC Act within 50 km of the Study area. Of these species, three have been listed as either "Known to Occur" or "Likely to Occur" within the Study area and have been summarised in **Table 3.4**.

It is noted that habitat for a near threatened species does not constitute an ESA, nor is it a PEM under the EO Act. The presence or potential presence of a near threatened species triggers requirements under the NC Act that are approved and managed separately to the EA. Therefore, the occurrence or potential occurrence of near threatened species or their habitat does not trigger any requirement to amend the Project EA. Impact assessment of near threatened species are undertaken in this report.

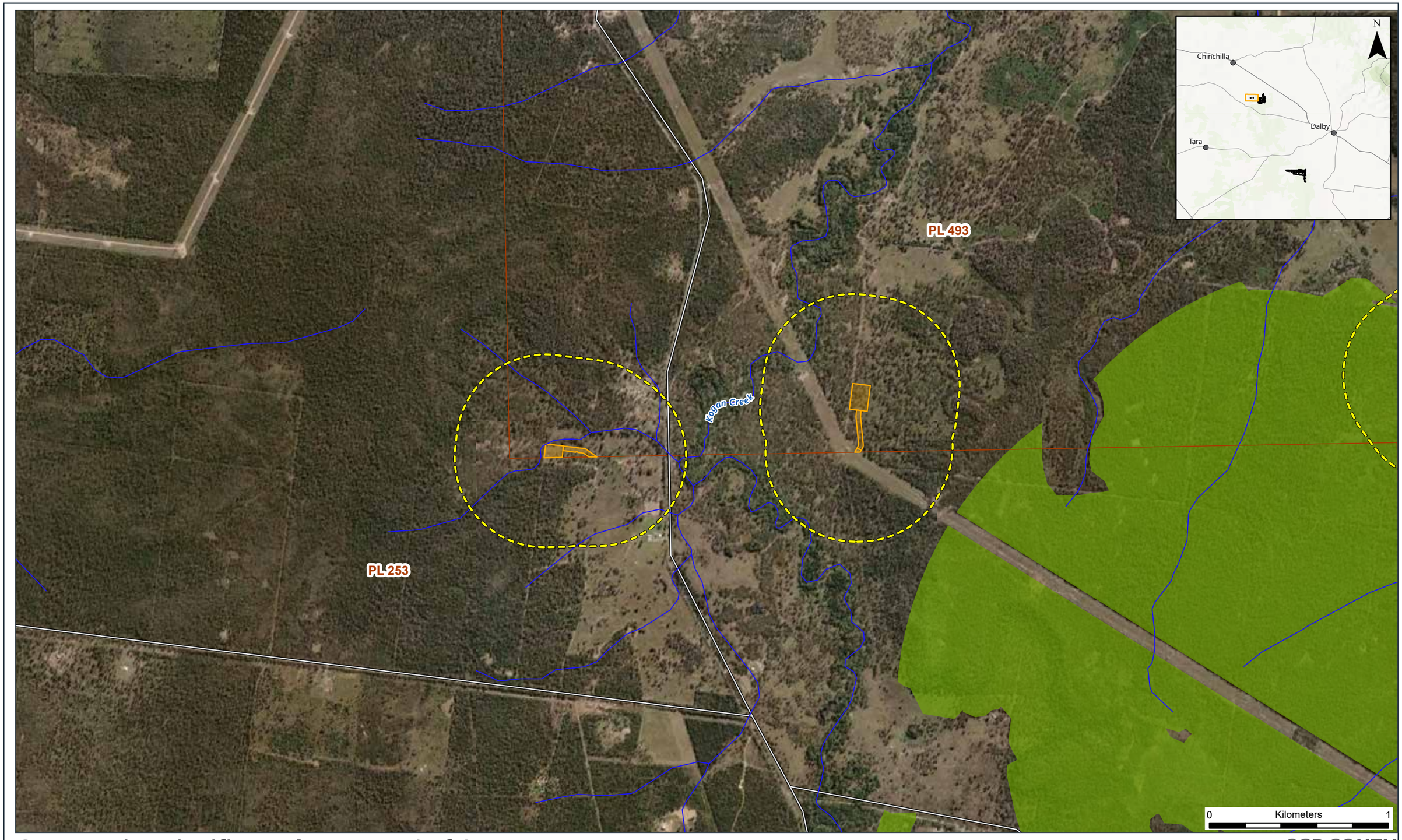
Table 3.4 Summary of "Known to Occur" and "Likely to Occur" flora species

Species Name	EPBC Act Status[1]	NC Act Status[2]	Likelihood of Occurrence & Rationale
Kogan Waxflower, *Philotheca sporadica*	-	E	**Known to Occur** Suitable habitat has been identified within the Study area and nearby historical records have been identified within the Study area (Arrow, 2024).
Rutidosis glandulosa	-	NT	**Likely to Occur** Potentially suitable habitat has been identified within the Study area, and nearby historical records have been recorded. The nearest record is approximately 1 km to the west of the Study area (Arrow, 2024).
Rutidosis lanata	-	NT	**Likely to Occur** Potentially suitable habitat has been identified within the Study area, and nearby historical records have been identified within the Study area (Arrow, 2024).

[1]EPBC Act Status: V = Vulnerable, E = Endangered, CE = Critically Endangered, Mi = Migratory, Ma = Marine

[2]NC Act Status: LC = Least Concern, SLC = Special Least Concern, NT = Near Threatened, V = Vulnerable, E = Endangered, CE = Critically Endangered

The conservation-significant flora habitat and records are mapped in **Figure 3.7**. There are three locations where Kogan Waxflower's are within the Project footprint.



Conservation-significant Flora (Page 1 of 6)

SGP SOUTH

- Kogan Waxflower Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- HRTM 100m Buffer
- Kogan Waxflower Habitat
- Protected Plants High Risk Area
- PL granted

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FIGURE 3.7

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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Conservation-significant Flora (Page 2 of 6)

SGP SOUTH

- Kogan Waxflower Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- HRTM 100m Buffer
- Kogan Waxflower Habitat
- Protected Plants High Risk Area
- PL granted

Attexo

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GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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Conservation-significant Flora (Page 3 of 6)

SGP SOUTH

- Kogan Waxflower Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- HRTM 100m Buffer
- Kogan Waxflower Habitat
- Protected Plants High Risk Area
- PL granted

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_126[C]

FIGURE 3.7

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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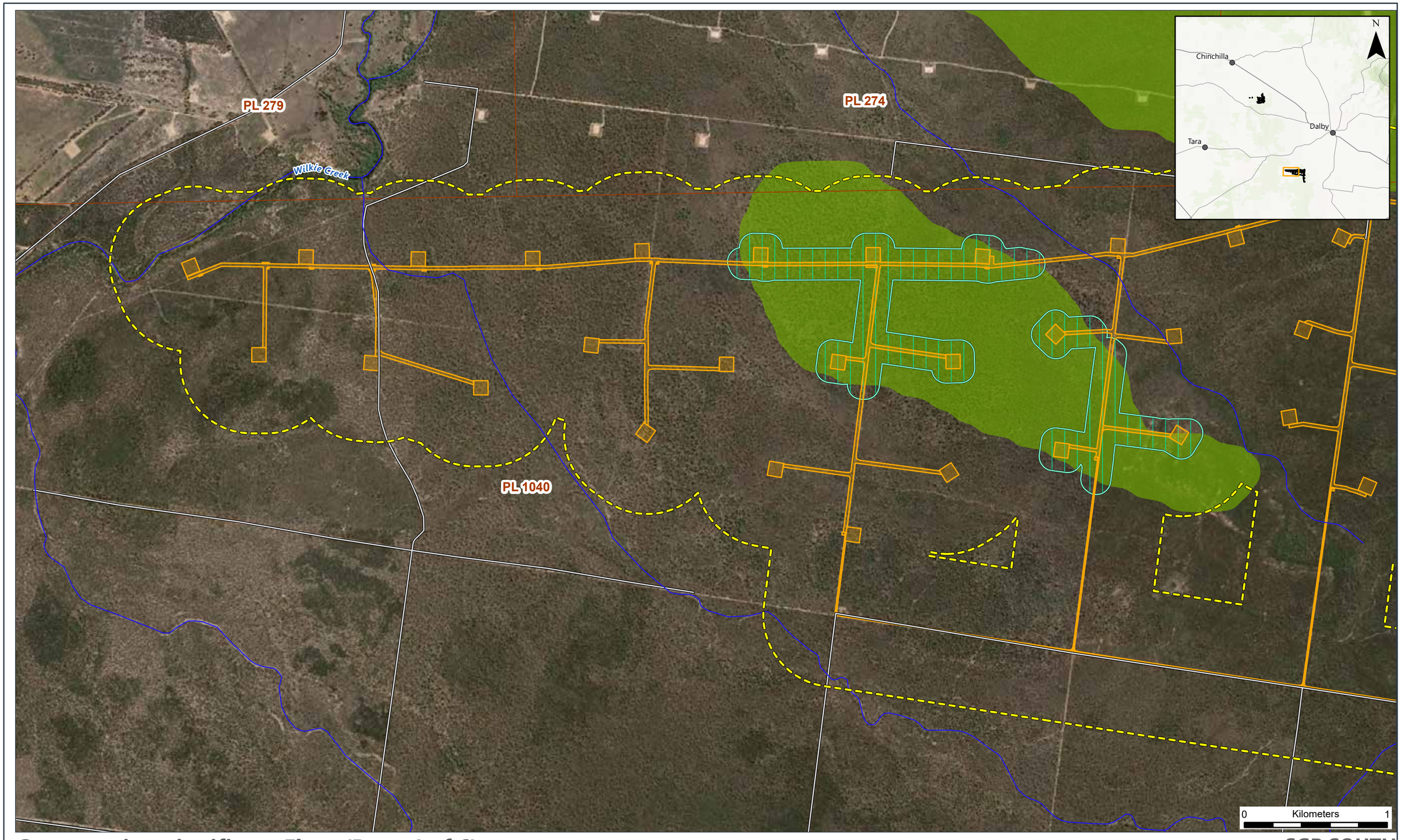

Conservation-significant Flora (Page 4 of 6)

SGP SOUTH

- Kogan Waxflower Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- HRTM 100m Buffer
- Kogan Waxflower Habitat
- Protected Plants High Risk Area
- PL granted

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_126[C] | **FIGURE 3.7**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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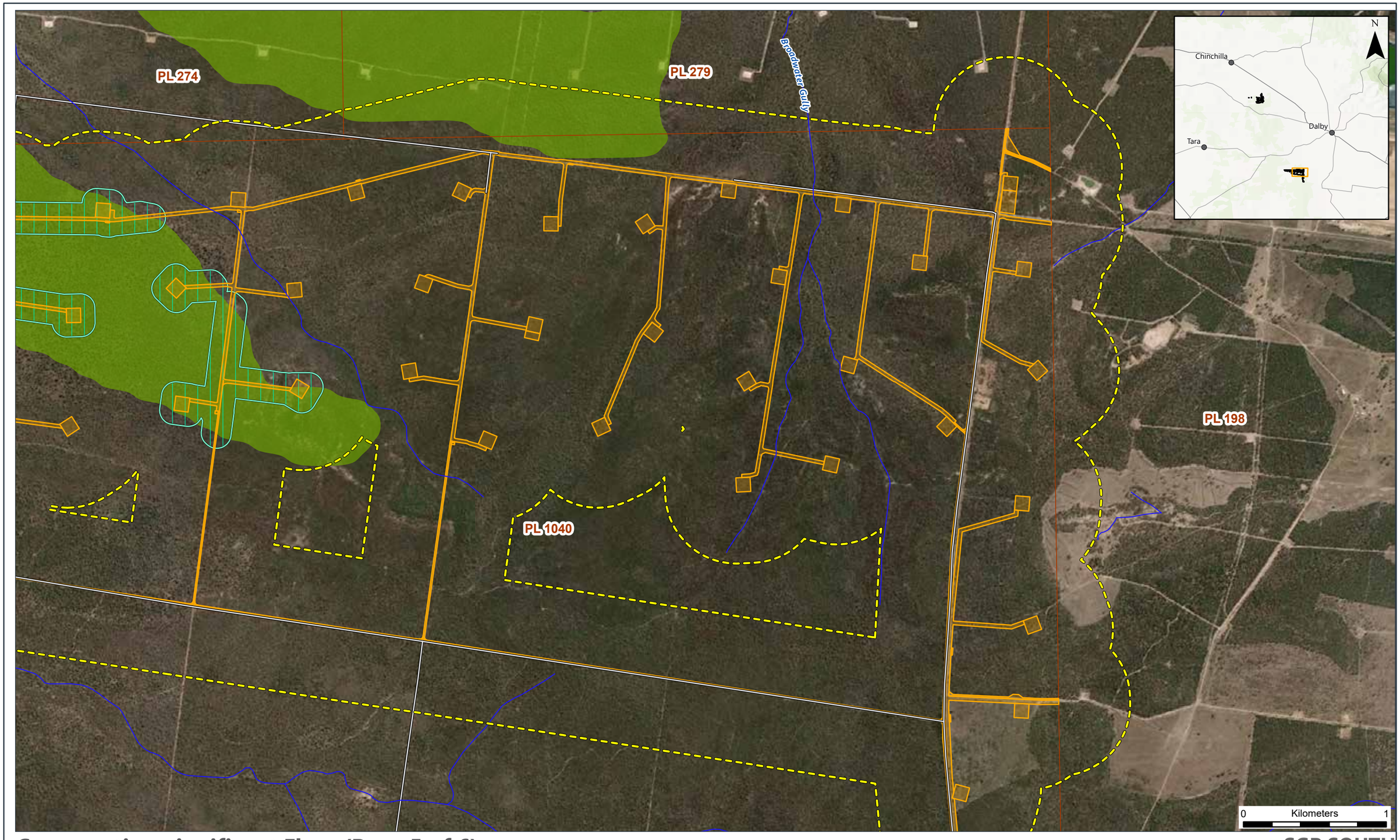

Conservation-significant Flora (Page 5 of 6)

SGP SOUTH

- Kogan Waxflower Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- HRTM 100m Buffer
- Kogan Waxflower Habitat
- Protected Plants High Risk Area
- PL granted

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_126[C] | **FIGURE 3.7**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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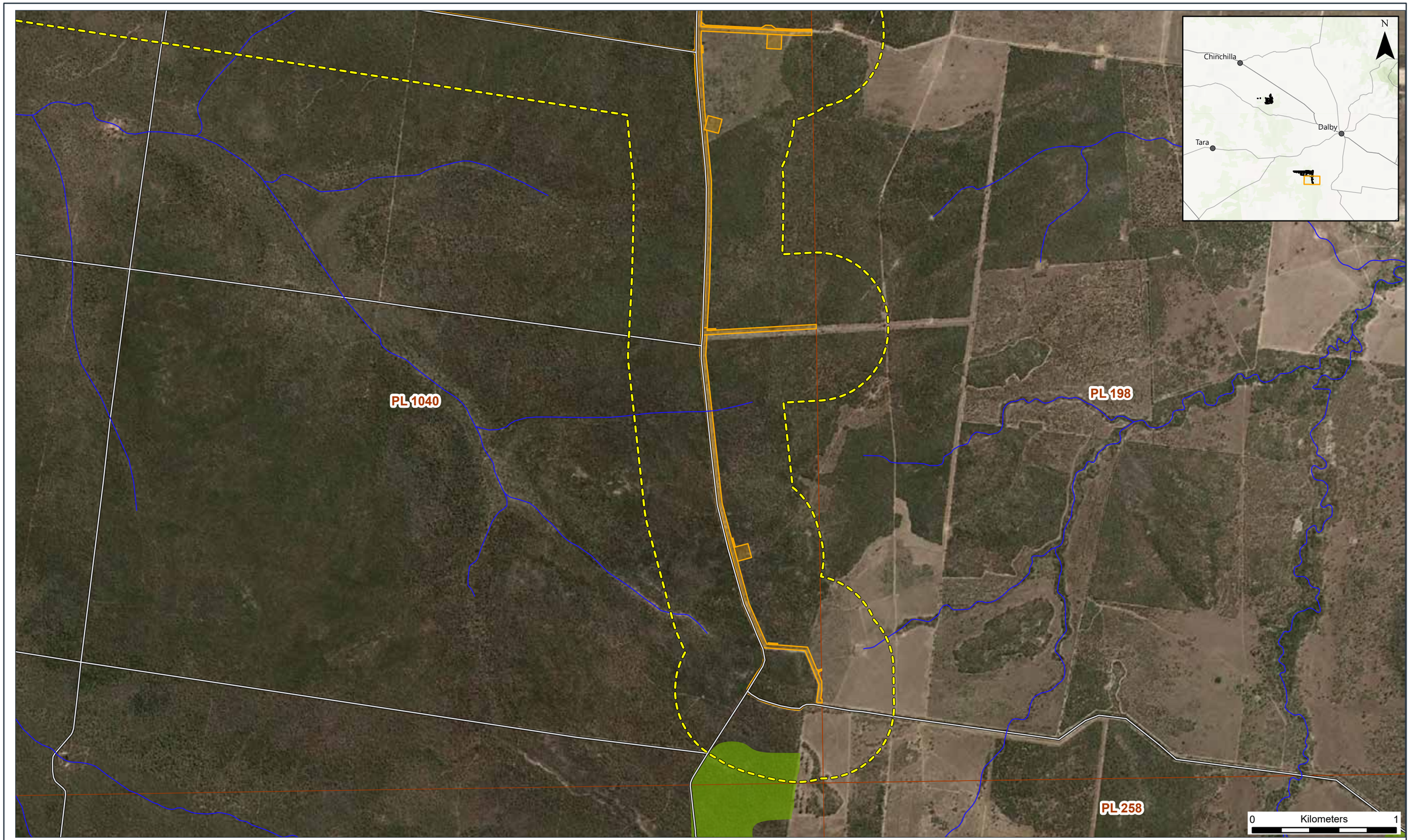

Conservation-significant Flora (Page 6 of 6)

SGP SOUTH

- Kogan Waxflower Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- HRTM 100m Buffer
- Kogan Waxflower Habitat
- Protected Plants High Risk Area
- PL granted

Attexo

REVIEWED: JC **DRAWN:** JT **SCALE (A3):** 1:25,000 **DATE:** 30/01/2025 **DWG No:** ARR-002_126[C] **FIGURE 3.7**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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3.3 Description of environmental values- terrestrial fauna

3.3.1 Habitat types and condition

The Study area is dominated by eucalypt woodland to open forest habitats on lateritic duricrusts, sand plains and remnant surfaces. Ecosystem types on soils of low fertility, typically those REs associated with land zones 5 and 7, form the largest and most continuous tracts of vegetation.

In the northern portion of the Study area, these have been heavily used for their timber resources with varying degrees of impact. In particular, habitats dominated by Narrow-leaved Ironbark (*Eucalyptus crebra*), Narrow-leaved Grey Box (*E. woollsiana*) and *E. elegans* have been logged to a such a degree that all mature canopy trees have been removed. The remaining vegetation comprises secondary growth with a thickened shrub layer forming the canopy. The impact of logging is also evident in the majority of remnant vegetation on freehold land. The future of these areas may be affected by changes to fire regime.

The southern portion of the Study area is mostly within the Kumbarilla State Forest and is dominated by Eucalypt woodlands on lateritic duricrust and contains extensive areas of *Eucalyptus crebra, E. populnea, E. chloroclada*, *Callitris glaucophylla* woodlands on sand plains and remnant surfaces

The following broad habitat types are present within the Study area based on ground-truth RE mapping (refer **Figure 3.6**):

- Eucalypt woodlands to open forests (6,480.0 ha) – dominant habitat type, representing approximately 96.9% of the available habitat in the Study area (**Plate 1**);
- Riparian and alluvial woodlands to open forests (168.2 ha) – typically occurs in riparian and alluvial areas associated with major creek systems, particularly Eastern Branch Creek (**Plate 2**), Kogan Creek and the Condamine River in the north and Wilkie Creek in the south. This represents approximately 2.5% of the available habitat in the Study area;
- Brigalow open forests to woodlands – small, discrete patches (13.6 ha) representing 0.2% of the available habitat in the Study area (**Plate 3**);
- Heaths (27.1 ha) – occurs as RE 11.7.5 and comprises approximately 0.4% of the available habitat in the Study area (**Plate 4**);
- Freshwater wetlands (1.6 ha) – very small, discrete area mapped in association with Kogan Creek representing <0.1% of the available habitat in the Study area (**Plate 5**); and
- Regrowth and non-remnant woody vegetation (cleared, fragmented or disturbed) (**Plate 6**).

Plate 1 Example of Eucalypt woodlands to open forest habitat type (EFS Tetris1-TR32: RE 11.7.4)

Plate 2 Example of Riparian woodlands to open forest habitat type (EFS Wyalla – T6: RE 11.3.25)

Plate 3 Example of brigalow open forests and woodlands habitat type (EFS COND-T6: RE 11.3.1)

Plate 4 Example of heath habitat type (EFS Wyalla-T7: RE 11.7.5)

Plate 5 Example of regrowth and non-remnant woody vegetation (EFS Halliford 97: Regrowth 11.5.4)

Plate 6 Example of cleared area (EFS Taylors-RE25)

3.3.2 Watercourses

Major watercourses are important landscape elements which act as significant migratory and dispersal pathways for many species of fauna and flora, contain important habitat resources (including food, water, sheltering, roosting and nesting sites) as well as provide refugia during periods of drought. Similar to most areas within the Brigalow Belt bioregion, waterways within the Study area often provide the only remaining landscape connectivity. The major creek systems in the northern portion of the Study area represent habitats that are often less impacted by historical clearing and also more likely to contain large trees due to their position in the landscape. The Study area is located within the Balonne-Condamine River catchment.

In the northern portion of the Study area, the main drainage features are associated with Kogan Creek and Eastern Branch Creek that drain into the Condamine River. The larger drainage features intersected by the Project include:

- Eastern-Branch Creek – stream order 2, ephemeral, *Eucalyptus tereticornis* or E. *camaldulensis* woodland fringing drainage lines (RE 11.3.25) (**Plate 7**); and
- Unnamed tributaries of Eastern-Branch Creek – stream orders 1 and 2, ephemeral, woodland on Cainozoic sand plains, Quaternary sediments and/or remnant surfaces (RE 11.5.1, RE 11.5.20 and RE 11.3.25).

East face of transect

North face of transect

Plate 7 Photos at Eastern-Branch Creek (EFS Taylors-T10 - 22/08/2024)

In the southern portion of the Study area, there are minor drainage features draining into Wilkie Creek in the west and Broadwater Gully in the east. Wilkie Creek flows into the Condamine River over 50 km to the north and Broadwater Gully flows into Lake Broadwater 7 km north and then into Wilkie Creek. The larger drainage features intersected by the Project include:

- An unnamed tributary of Wilkie Creek – stream order 2, ephemeral, woodland on Cainozoic sand plains and/or remnant surfaces, woodland on Cainozoic sand plains, and woodland fringing drainage lines (RE 11.5.1 and RE 11.5.20); and
- Broadwater Gully – stream order 2, ephemeral, woodland on Cainozoic sand plains and/or remnant surfaces (RE 11.5.1).

3.3.3 State Forests

Kumbarilla State Forest occurs within the southern portion of the Study area as shown in **Figure 3.1.** The main habitats in and around Kumbarilla State Forest include remnant and regrowth eucalypt woodlands (RE 11.5.1, 11.5.20 and 11.7.4) on land zones 5 and 7, along with taller forests (RE 11.5.4). Habitat quality in the area has been impacted by historic logging, particularly that associated with the Kumbarilla State Forest and fires, as described by Ecosmart (2017):

"While, on balance, the State Forests have retained greater conservation value than vegetation on freehold land, the future of these areas may be affected by changes to fire regime. Within the last 10 years, three extremely hot fires have affected large expanses of State Forest within the SGP study area, and in the case of Kumbarilla State Forest on more than one occasion. These hot fires can cause significant damage to the canopy and vegetation composition (by removing fire-sensitive species). It is likely the vegetation will take many decades to fully recover after a significant wildfire. The frequency and intensity of wildfires are predicted to increase due to climate change (Williams et al. 2001), possibly leading to possible broad-scale vegetation changes."

Kumbarilla State Forest area (including the adjacent Waar Waar and Vickery State Forests) is located immediately south of the Moonie Highway. Kumbarilla State Forest is part of a large contiguous patch of vegetation that forms part of a State-significant biodiversity corridor that runs east-west to Kogan Creek (south of Kogan) and north-south between Dalby State Forest and Western Creek State Forest (east of Millmerran) (**Figure 3.1**). The buffer applied to this corridor by the Brigalow Belt Biodiversity Planning Assessment is 5 km in width (DES, 2018).

3.3.4 Conservation-significant fauna

The desktop assessment identified records for 65 threatened fauna species considered as part of the Likelihood of Occurrence Assessment (**Appendix D**). Of these, 15 species are listed as MNES but are not listed as threatened under the NC Act and are excluded from further assessment, namely:

- Black-tailed Godwit (*Limosa limosa*);
- Common Greenshank (*Tringa nebularia*);
- Common Sandpiper (*Actitis hypoleucos*);
- Fork-tailed Swift (*Apus pacificus*);
- Marsh Sandpiper (*Tringa stagnatilis*);
- Oriental Cuckoo (*Cuculus optatus*);
- Osprey (*Pandion haliaetus*);
- Pectoral Sandpiper (*Calidris melanotos*);
- Sharp-tailed Sandpiper (*Calidris acuminata*);
- Wood Sandpiper (*Tringa glareola*);
- Yellow Wagtail (*Motacilla flava*);
- Grey-headed Flying-fox (*Pteropus poliocephalus*);
- Northern Quoll (*Dasyurus hallucatus*);
- Murray cod (Maccullochella peelii); and
- Silver Perch (Bidyanus bidyanus).

Of those species listed under the NC Act, there are 10 species assessed as known or likely to occur in the Study area and records of these species used in the assessment are shown on **Figure 3.8**. These species have been summarised in **Table 3.5** with records and potential habitat shown in **Figure 3.8** to **Figure 3.12**. Descriptions for these species have been provided from **Section 3.3.4.1** to **Section 3.3.4.9** and **Section 3.3.5**.

Species that were assessed as unlikely to occur or potential to occur in the Study area (**Section 1.2.1**) do not have a significant residual impact and are not a PEM (under the EO Act) for the Project.

Table 3.5 Prescribed Environmental Matters – Fauna species known or likely to occur in the Study area

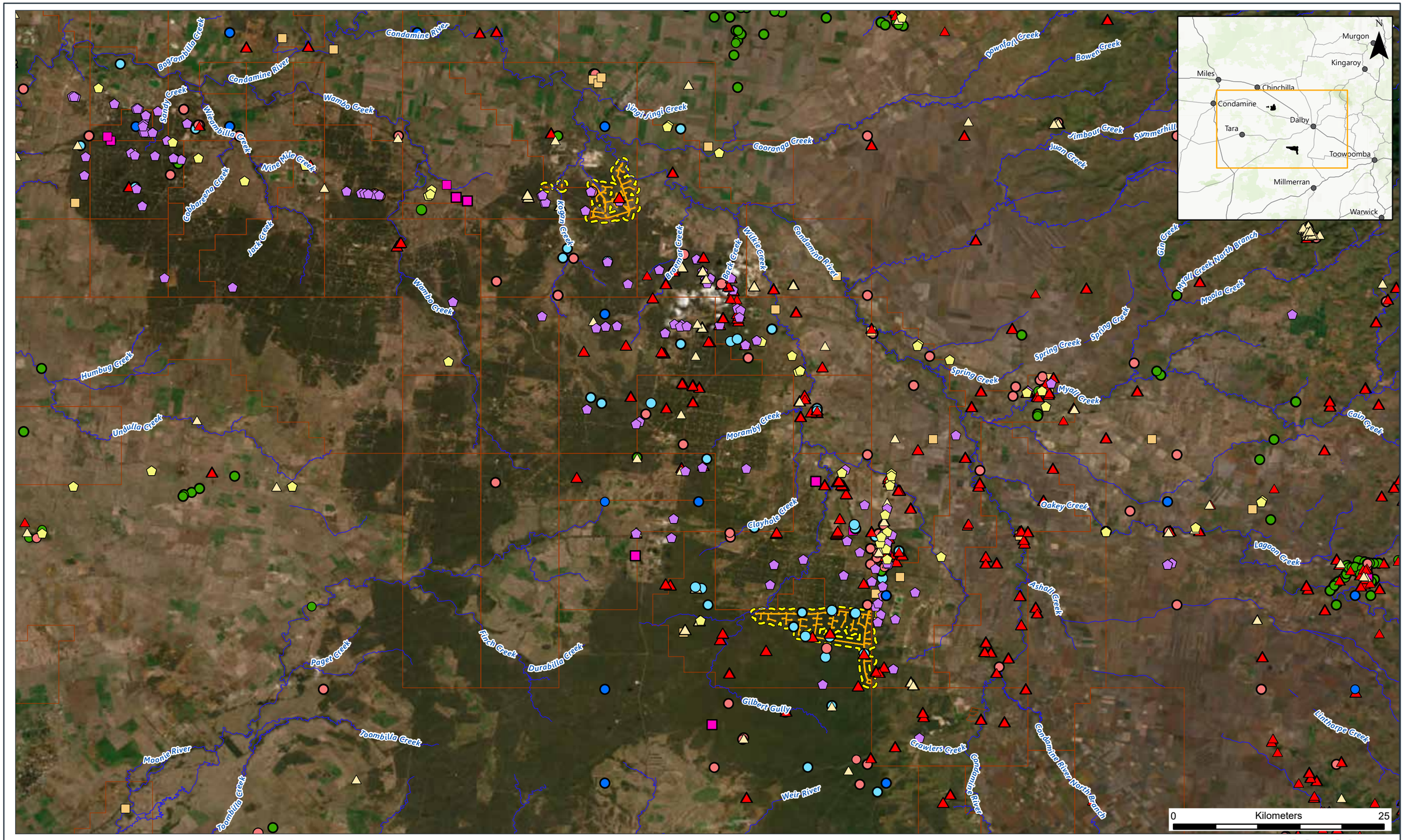
Species Name	EPBC Act Status[1]	NC Act Status[2]	Likelihood of Occurrence & Rationale
Bird Species			
Diamond Firetail, *Stagonopleura guttata*	V	V	**Likely to Occur** Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is approximately 3 km to the north-east (ALA, 2012).
Glossy Black-cockatoo (south-eastern), *Calyptorhynchus lathami lathami*	V	V	**Known to Occur** Suitable habitat has been identified within the Study area and nearby historical records have been identified within the Study area (ALA, 2005).
Painted Honeyeater, *Grantiella picta*	V	V	**Likely to Occur** Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is approximately 7 km to the north (ALA, 2016).
White-throated Needletail, *Hirundapus caudacutus*	V, Mi, Ma	V	**Likely to Occur** This species is predominantly aerial and can occur anywhere in Australia. Suitable foraging habitat is likely to be present in the airspace above the Study area and nearby historical records have been identified. The nearest record is approximately 7 km to the north (ALA, 2021).
Invertebrates			
Brigalow Woodland Snail, *Adclarkia cameroni*	E	V	**Likely to Occur** Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is approximately 5 km to the north-east (ALA, 2012).
Pale Imperial Hairstreak, *Jalmenus eubulus*	-	V	**Likely to Occur** Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is approximately 8 km to the north (ALA, 1988).

Species Name	EPBC Act Status[1]	NC Act Status[2]	Likelihood of Occurrence & Rationale
Mammal Species			
Koala, *Phascolarctos cinereus*	E	E	**Known to Occur#** Suitable habitat has been identified within the Study area and nearby historical records have been identified within the Study area (ALA, 2009).
Short-beaked Echidna, *Tachyglossus aculeatus*	-	SLC	**Likely to Occur** Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is approximately 1 km to the west (Arrow, 2024).
Reptile Species			
Golden-tailed Gecko, *Strophurus taenicauda*	-	NT	**Likely to Occur** Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is less than 1 km to the east (Arrow, 2012).
Grey Snake, *Hemiaspis damelii*	E	E	**Likely to Occur** Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is approximately 5 km to the east (Arrow, 2024).

[1]EPBC Act Status: V = Vulnerable, E = Endangered, CE = Critically Endangered, Mi = Migratory, Ma = Marine

[2]NC Act Status: LC = Least Concern, SLC = Special Least Concern, NT = Near Threatened, V = Vulnerable, E = Endangered, CE = Critically Endangered

MNES species that have impacts approved under EPBC approvals 2010/5344



Conservation-significant fauna that are known or likely to occur in the Study Area

SGP SOUTH

Birds:
- Glossy Black-cockatoo
- Diamond Firetail
- Painted Honeyeater
- White-throated Needletail

Invertebrate:
- Brigalow Woodland Snail
- Pale Imperial Hairstreak

Mammal:
- Koala
- Short-beaked Echidna

Reptile:
- Golden-tailed Gecko
- Grey Snake
- Watercourse

- Study Area (500m Buffer)
- Project Footprint
- PL granted

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FIGURE 3.8

GDA2020

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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3.3.4.1 Diamond Firetail, *Stagonopleura guttata*

Whilst there are no records of this species within the northern or southern portions of the Study area, there are scattered (undated) records in the region surrounding the Study area. This species has also been recorded during extensive survey efforts undertaken across the broader SGP. It does occur across a range of habitat types, including eucalypt woodland, banksia shrubland and cypress forest. Populations appear unable to persist in fragmented areas which lack remnant patches of larger than 200 ha (DCCEEW, 2023).

The Diamond Firetail is granivorous, with a diet consistent predominantly of grass seeds, with the remainder of the diet typically made up of forbs. Foraging occurs almost exclusively on the ground, with only a small number of foraging bouts at 1-2 m above the ground (DCCEEW, 2023). Ideal foraging habitat for Diamond Firetails is characterised by mostly open areas with low tree density, low percentage cover of fallen logs and high percentage cover of grass, with patches of bare ground, moss and forbs.

Few accurate records are available for this species and, in the absence of data, evaluating important REs can only be achieved through descriptive comparison of each RE to known high amenity habitat features. This suggests all forests and woodlands within the Study area could potentially be inhabited though, on balance, heathland habitats (RE 11.7.5) and *Acacia*-dominated woodlands (RE 11.7.2) are likely too thick and with reduced grass cover (EcoSmart 2023).

Potentially suitable habitat within the Study area is shown in **Figure 3.9**.

3.3.4.2 Glossy Black-cockatoo, *Calyptorhynchus lathami lathami* (south-eastern)

Glossy Black-cockatoos are well represented in the broader SGP area, though records in the northern portion of the Study area are less frequent than in the southern portion of the Study area, with most records from Lake Broadwater and Kumbarilla State Forest. Two records (from 2000 and 2005) have been identified within the southern portion of the Study area, within remnant vegetation.

Typically encountered in small family parties, Glossy Black-cockatoos are dietary specialists feeding exclusively on the seeds of *Allocasuarina* and less frequently *Casuarina* spp. Favoured species include *A. torulosa*, *A. littoralis*, *A. distyla*, *A. diminuta*, *A. gymnanthera* and *A. verticillata*. Birds show a preference for productive trees (e.g. higher seed/cone weight ratio), notwithstanding the influence of other factors such as distance from water or breeding hollows. Stands of *Allocasuarina* are not, therefore, of uniform value and the loss of individual stands or trees can have disproportionate impacts. Although an *Allocasuarina* species, *A. luehmannii* has small seeds and is infrequently used (DCCEEW, 2022d).

Birds inhabit woodlands and forests that contain abundant *Allocasuarina* spp. and large hollows suitable for nesting. Many populations are restricted to remnant vegetation within hills and gullies surrounded by agricultural land though some populations move through artificial landscapes to access favoured food resources (EcoSmart, 2023). Groups are never far from waterbodies, which are visited daily. Being highly mobile, birds may travel considerable distances to isolated fragments in search of food. Advanced regrowth may also provide some foraging opportunities.

Within the Study area, only RE 11.7.4 contains preferred feed tree species (*Allocasuarina littoralis*) though EcoSmart (2023) observed that *A. littoralis* is more likely to be present in areas south of the Warrego Highway. The dominant she-oak species associated with RE 11.5.1 (*Allocasuarina leuhmanii*) is not regarded as a preferred feed tree species though it is thought to be an occasional food source in inland NSW and may be used in some years (DCCEEW, 2022). Other RE types in the broader SGP area recorded by EcoSmart (2023) containing *Casuarina cristata* (11.3.1, 11.3.17, 11.4.3, 11.4.3a, 11.9.5) and *Allocasuarina inophloia* (11.5.4) do not occur in the Study area.

Potentially suitable habitat within the Study area is shown in **Figure 3.9.**

3.3.4.3 Painted Honeyeater, *Grantiella picta*

Scattered records of this species occur in the region surrounding the Study area, with the closest records clustered around Lake Broadwater and to the west of Jandowae. The closest record is approximately 7 km to the north (ALA, 2016). This species is the most specialised of Australia's honeyeaters, as their diet consists of mistletoe fruits but can also include nectar (from mistletoes, eucalypts and possibly banksias) and arthropods, especially during the non-breeding season (DoE, 2015a). This species inhabits mistletoes in a range of woodland communities including eucalypt forests/woodlands, riparian woodlands of black box and river red gum and *Acacia* dominated woodlands.

An analysis of records undertaken by EcoSmart (2023) identified that the vast majority of records (97% of 533 records) for this species occur within non-remnant habitats or within remnant habitats associated with BVG 25a which are dominated by Brigalow (*Acacia harpophylla*). A very small number of records (<0.2%) are within other vegetation types. On this basis, only remnant, disturbed and regrowth REs dominated by Brigalow (comprising RE 11.3.1, 11.3.17, 11.4.3, 11.43a and 11.9.5) are considered 'core habitat' within the SGP.

Potentially suitable habitat within the Study area is shown in **Figure 3.9.**

3.3.4.4 White-throated Needletail, *Hirundapus caudacutus*

Numerous records of the White-throated Needletail have been recorded in the region surrounding the Study area, with a closest records being concentrated around Lake Broadwater, approximately 7 km to the north of the southern portion of the Study area (ALA, 2021).

The White-throated Needletail is widespread in eastern and south-eastern Australia where it has been recorded in all coastal regions of QLD and NSW, extending inland to the western slopes of the Great Dividing Range and occasionally into the adjacent inland plains (TSSC, 2019b).

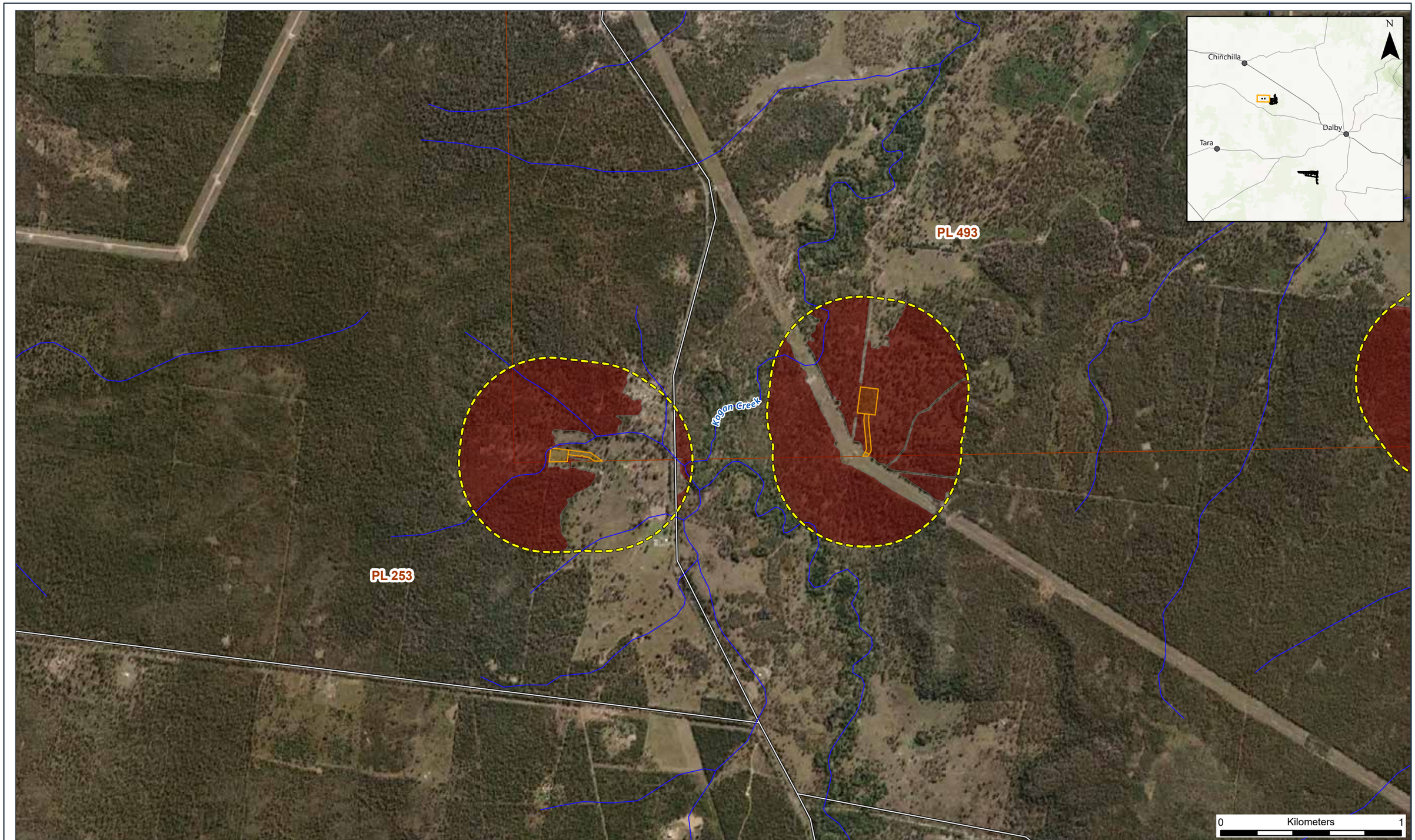
The breeding distribution of this species is fragmentated, with two subspecies occurring in different parts of Asia. The nominate subspecies (*H.c. nudipes*) breeds from south-western China to northern Pakistan and is largely resident. Individuals found in Australia all belong to the *H.c. caudacutus* subspecies which are non-breeding migrants to Australia.

In Australia, the White-throated Needletail is mostly aerial, from heights of less than 1 m to up to more than 1,000 m (TSSC, 2019). They are known to forage over most habitat types however, they are most often recorded above wooded areas including open forest and rainforest. They have also been recorded foraging above farmland, cleared pasture, plantations and remnant vegetation at the edge of paddocks.

Whilst this species spends most of their time on the wing, they are known to roost in trees amongst dense foliage in the canopy or in hollows. During the non-breeding season in Australia, this species has been recorded eating a wide variety of insects.

White-throated needletail is likely to overfly all parts of the Study area on migration to and from Australia, with all airspace over wooded habitats likely to represent potentially suitable foraging habitat. Considering that this species is almost exclusively aerial, impacts to terrestrial habitat are unlikely to affect the availability of potentially suitable foraging habitat.

The White-throated Needletail has a preference for dense roosting habitat (TSSC, 2019). The structural category of REs as listed in the REDD provides a useful proxy, with 'dense' REs indicating potential roosting habitat. A review of ground-truthed REs in the Study area indicated that there is no suitably dense roosting habitat occurring within the Study area.



Conservation-significant Fauna - Birds (Page 1 of 6)

SGP SOUTH

- Diamond Firetail Record
- Glossy Black-cockatoo Record
- Painted Honeyeater Record
- White-throated Needletail Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Painted Honeyeater Potential Habitat
- Glossy Black Cockatoo Potential Habitat
- Diamond Firetail Potential Habitat

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FIGURE 3.9

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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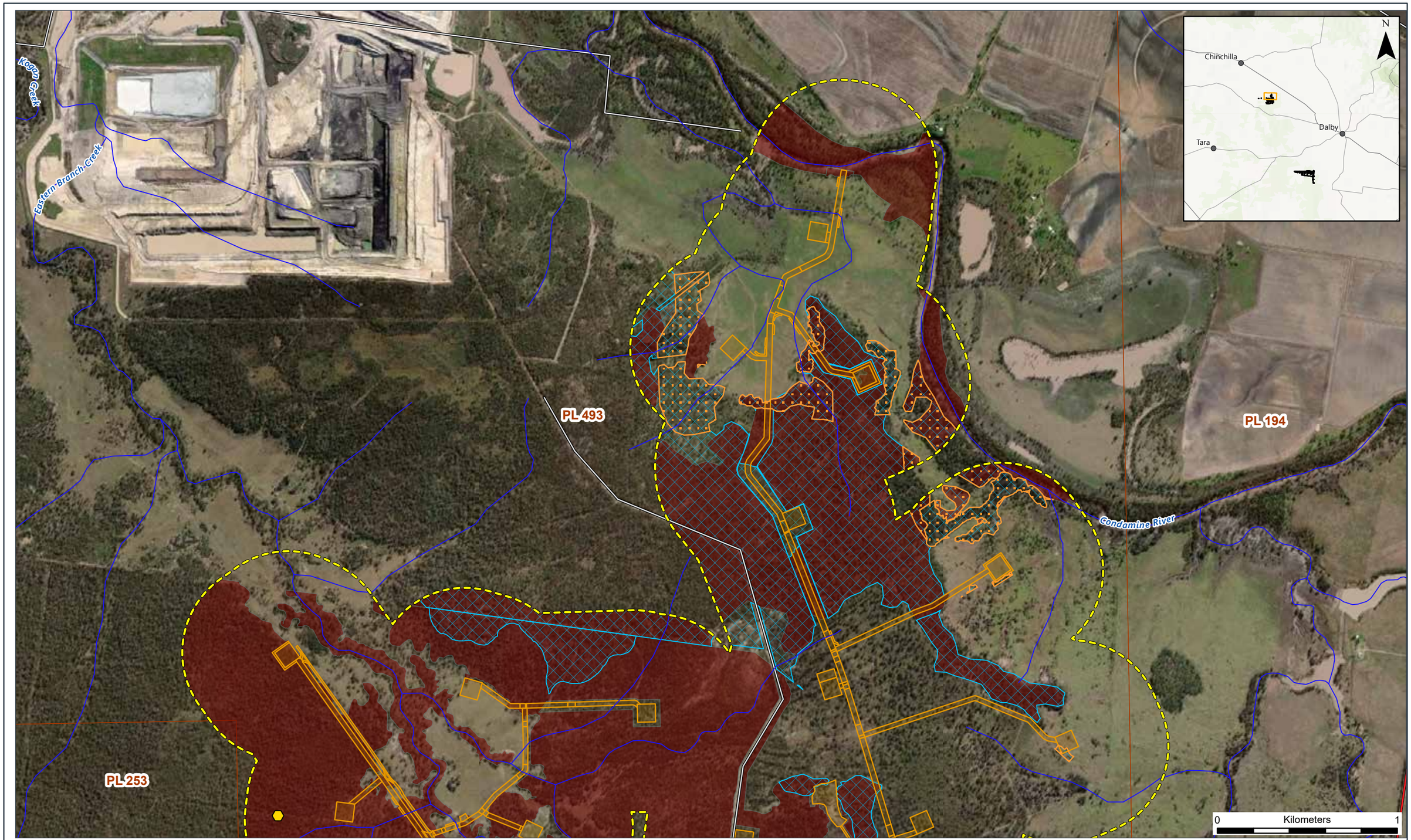

Conservation-significant Fauna - Birds (Page 2 of 6)

SGP SOUTH

- Diamond Firetail Record
- Glossy Black-cockatoo Record
- Painted Honeyeater Record
- White-throated Needletail Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Painted Honeyeater Potential Habitat
- Glossy Black Cockatoo Potential Habitat
- Diamond Firetail Potential Habitat

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REVIEWED: JC **DRAWN:** JT **SCALE (A3):** 1:20,000 **DATE:** 30/01/2025 **DWG No:** ARR-002_126[C] **FIGURE 3.9**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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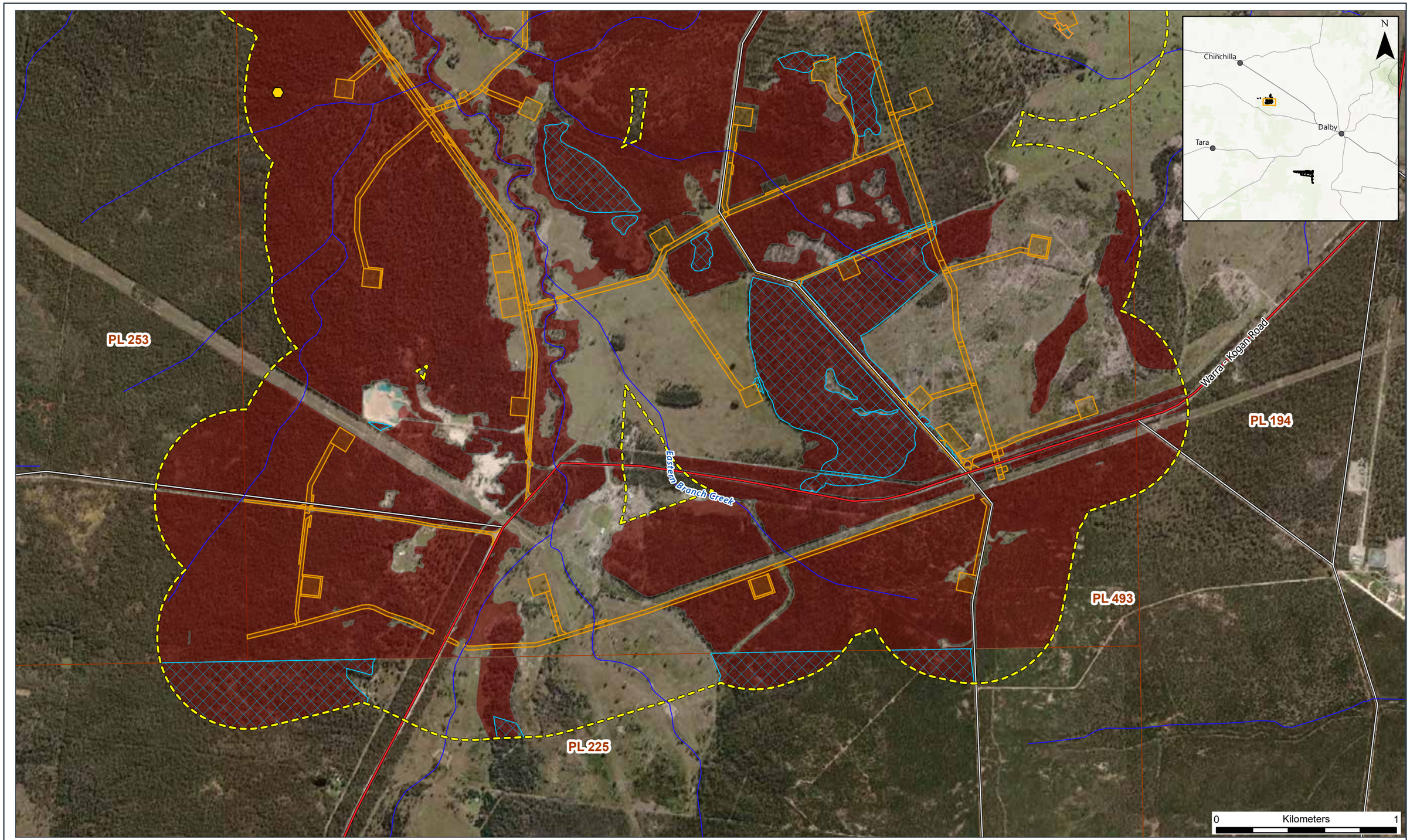

Conservation-significant Fauna - Birds (Page 3 of 6)

SGP SOUTH

- Diamond Firetail Record
- Glossy Black-cockatoo Record
- Painted Honeyeater Record
- White-throated Needletail Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Painted Honeyeater Potential Habitat
- Glossy Black Cockatoo Potential Habitat
- Diamond Firetail Potential Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_126[C]

FIGURE 3.9

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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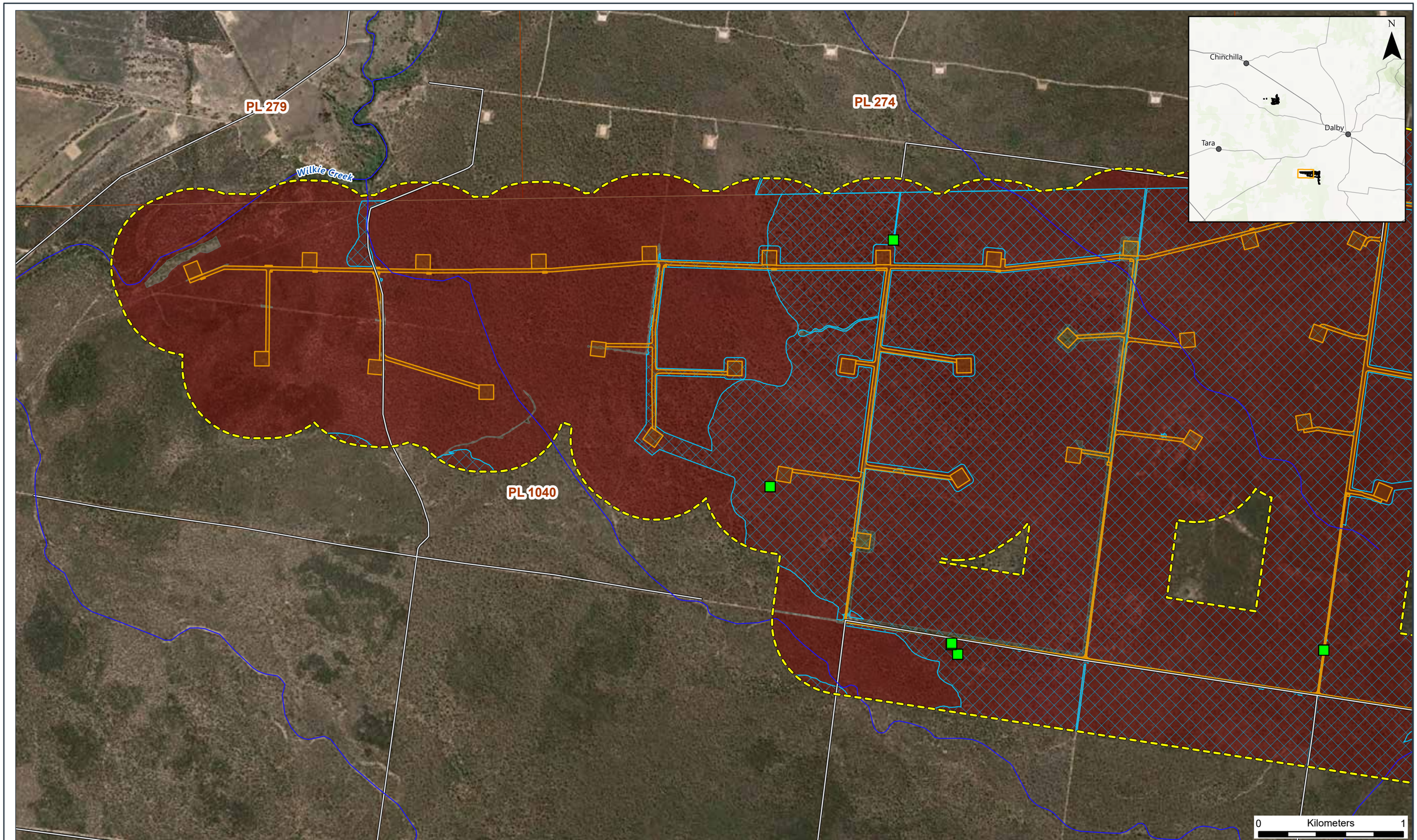

Conservation-significant Fauna - Birds (Page 4 of 6)

SGP SOUTH

- Diamond Firetail Record
- Glossy Black-cockatoo Record
- Painted Honeyeater Record
- White-throated Needletail Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Painted Honeyeater Potential Habitat
- Glossy Black Cockatoo Potential Habitat
- Diamond Firetail Potential Habitat

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REVIEWED: JC **DRAWN:** JT **SCALE (A3):** 1:25,000 **DATE:** 30/01/2025 **DWG No:** ARR-002_126[C]

FIGURE 3.9

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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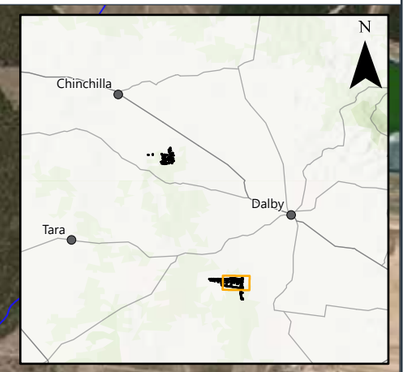
PL 274

PL 279

Broadwater Gully

PL 198

PL 1040



0 Kilometers 1

Conservation-significant Fauna - Birds (Page 5 of 6)

SGP SOUTH

- Diamond Firetail Record
- Glossy Black-cockatoo Record
- Painted Honeyeater Record
- White-throated Needletail Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Painted Honeyeater Potential Habitat
- Glossy Black Cockatoo Potential Habitat
- Diamond Firetail Potential Habitat

Attexo

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FIGURE 3.9

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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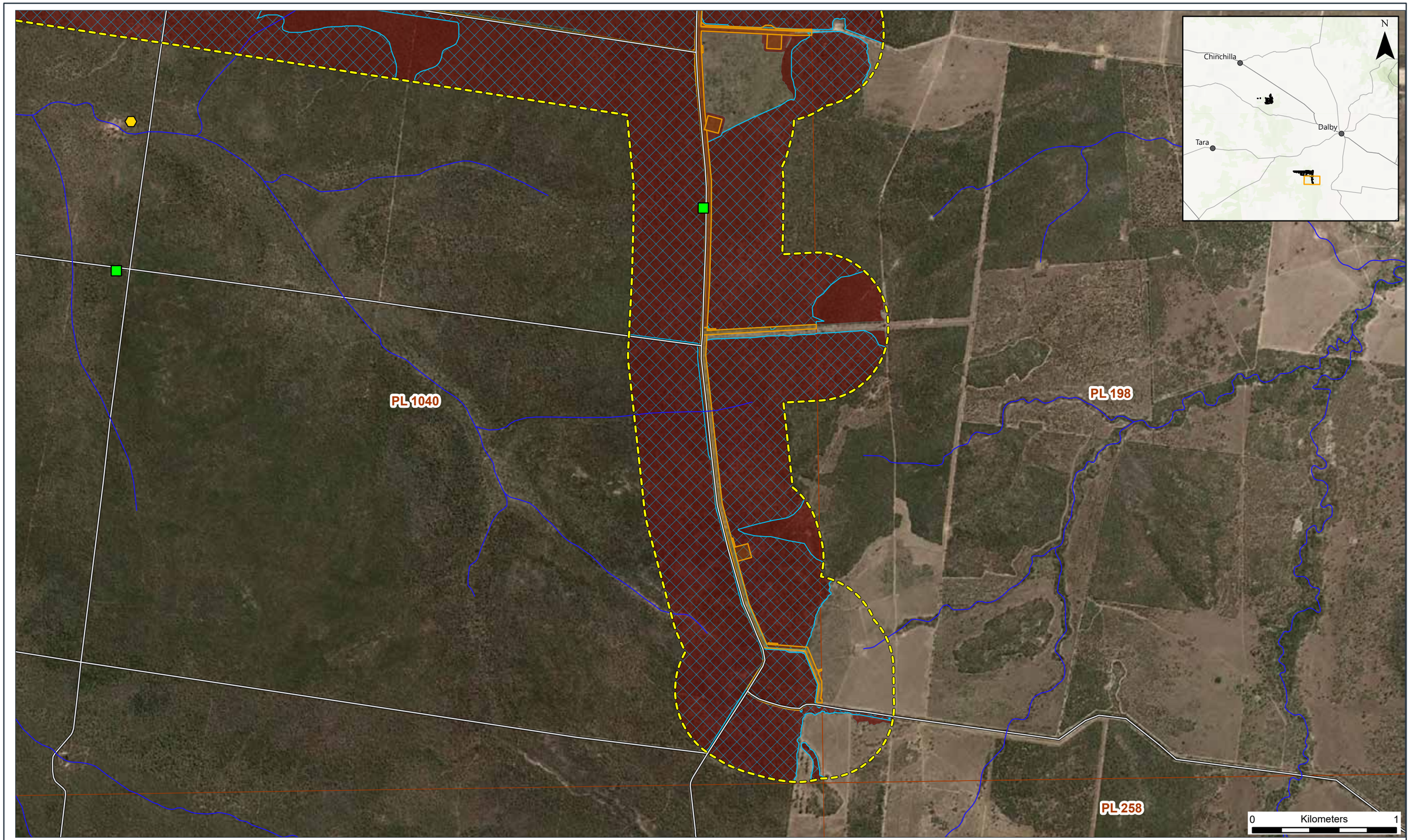

Conservation-significant Fauna - Birds (Page 6 of 6)

SGP SOUTH

- Diamond Firetail Record
- Glossy Black-cockatoo Record
- Painted Honeyeater Record
- White-throated Needletail Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Painted Honeyeater Potential Habitat
- Glossy Black Cockatoo Potential Habitat
- Diamond Firetail Potential Habitat

Attexó

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_126[C] | **FIGURE 3.9**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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3.3.4.5 Brigalow Woodland Snail, *Adclarkia cameroni*

The Brigalow Woodland Snail is part of the family *Camaenidae* and is a medium-sized species characterised by a somewhat flattened shell, with rounded and tightly coiled whorls, the last of which is flared (TSSC, 2016b). This species is endemic to southeast Queensland, where it occurs in a small number of remnant and scattered *Acacia harpophylla* (Brigalow) and eucalypt woodland patches (commonly along road verges and riparian corridors) along the Condamine River floodplain, especially in the area around Dalby and Chinchilla (TSSC, 2016b).

The current distribution of this species is severely fragmentated. The Brigalow communities within the Condamine River floodplain (located to the north of the Study area) that were once contiguous throughout the species' historical distribution have been extensively cleared to support agricultural and pastoral activities (TSSC, 2016b). The current distribution of this species along the floodplain (from approximately 17 km south of Dalby to around Miles), reflects this broad scale clearing (TSSC, 2016b). The nearest recorded individual to the Study area is located approximately 5 km to the northeast.

EcoSmart identified Brigalow communities on clay soils as well as most eucalypt woodlands on floodplains as potentially suitable habitat for this species (EcoSmart, 2023). Within the Study area, the following REs that have been mapped as potentially suitable habitat for the Brigalow Woodland Snail: REs 11.3.2, 11.3.4, 11.3.25, 11.3.27f, 11.4.3, 11.4.3a. Potentially suitable habitat for this species also incorporates other vegetation communities that occur within a 1 km buffer around known records.

This species is found in Brigalow and alluvial eucalypt woodlands which have dense cover and scattered debris, especially logs, dense leaf litter, piles of fallen bark and flood debris (TSSC, 2016b). It has also been recorded from highly disturbed and cleared habitats if there is suitable shelter on the ground (e.g. logs). Within the broader SGP, these habitats are most consistent with REs 11.3.1, 11.3.2, 11.3.3, 11.3.17, 11.3.25, 11.3.27, 11.4.3, 11.4.3a, 11.9.5, 11.9.7 and 11.9.10. The species can also occasionally occur in RE 11.5.1 when nearby favourable habitat is removed (Eddie, 2023). RE 11.5.1 is not consistent with the current understanding of high amenity habitat, though revision of this may be required in the future as additional surveys / information shed light on the species requirements (EcoSmart, 2023).

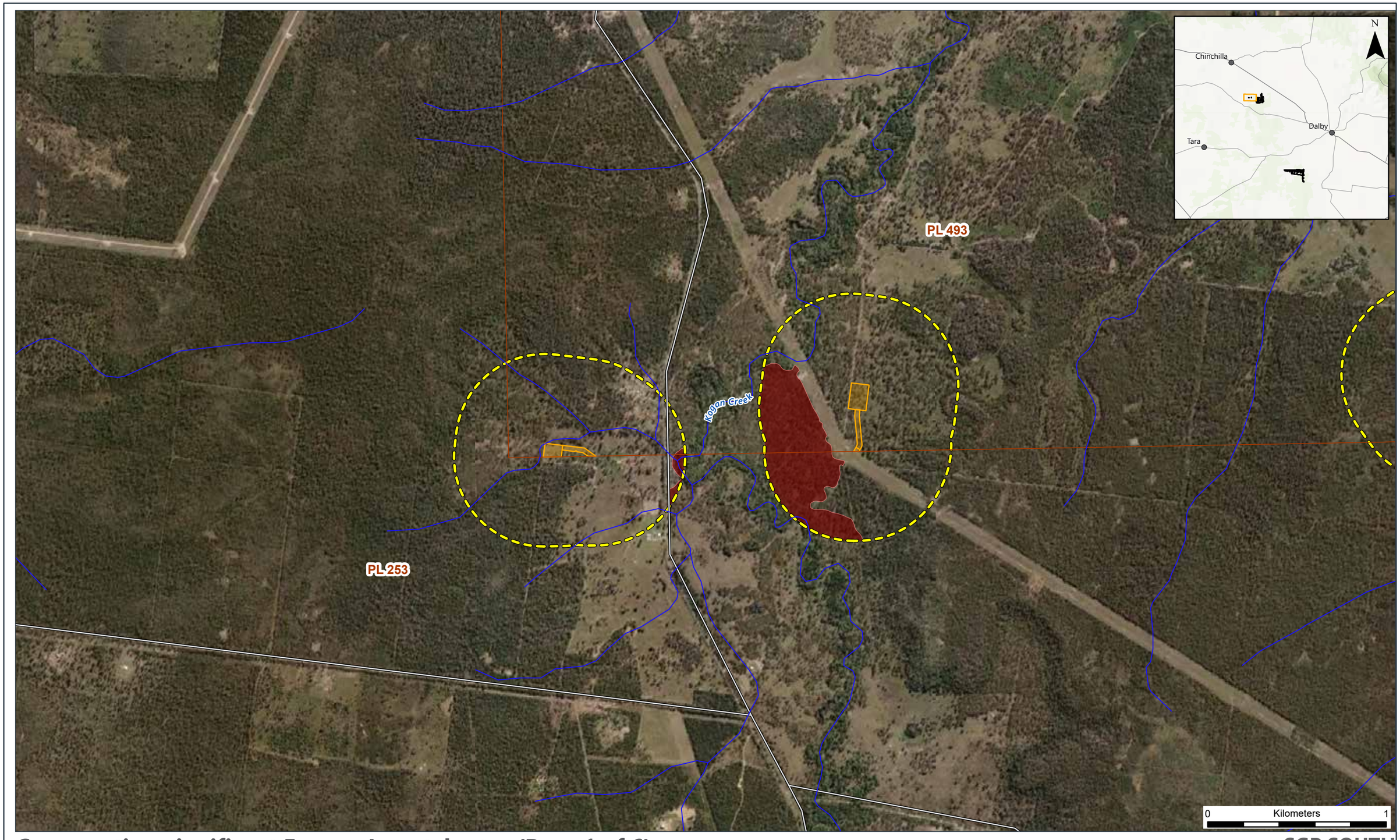
Potentially suitable habitat for this species within the Study area has been shown on **Figure 3.10**.

3.3.4.6 Pale Imperial Hairstreak, *Jalmenus eubulus*

The Pale Imperial Hairstreak is a striking medium-sized butterfly that has recently been recognised as a separate species from the closely related Imperial Hairstreak (*Jalmenus evagoras*) which shares similar morphologies (NSW Environment & Heritage, 2021). The Pale Imperial Hairstreak is found in New South Wales and Queensland where it is restricted to the seasonally sub-humid central and southern areas of the State. In New South Wales this species is only found in Brigalow-dominated open forests and woodlands in northern areas of the state. Both the northern and southern portions of the Study area are situated in the middle of this species' distribution with several records located within 8 km (ALA, 1998).

This species is only known to breed in old-growth forests or woodlands and does not appear to colonise regrowth vegetation following clearing or other major disturbances (NSW Environment & Heritage, 2021). Potentially suitable habitat for this species is dominated by Brigalow (*Acacia harpophylla*) and Buloke (*Casuarina cristata*) on clay soils on flat to gently undulating plains, usually with scattered emergent eucalypts such as Poplar Box (*Eucalyptus populnea*) and low trees of Wilga (*Geijera parviflora*) (NSW Environment & Heritage, 2021). The Pale Imperial Hairstreak feeds exclusively on Brigalow on which it lays its eggs. The larvae are always attended by ants of the *Iridomyrmex* group, on which they are likely to be reliant for survival (EcoSmart, 2023).

Considering this species reliance on old-growth Brigalow vegetation EcoSmart identified several REs as likely providing suitable habitat for this species, including RE 11.4.3 and 11.4.3a. Potentially suitable habitat for this species also incorporates other vegetation communities that occur within a 500 m buffer around known records. Potentially suitable habitat for this species within the Study area is shown on **Figure 3.10**.



Conservation-significant Fauna - Invertebrates (Page 1 of 6)

SGP SOUTH

- Brigalow Woodland Snail Record
- Pale Imperial Hairstreak Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Brigalow Woodland Snail Potential Habitat
- Pale Imperial Hairstreak Potential Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 10/03/2025 | **DWG No:** ARR-002_128[C] | **FIGURE 3.10**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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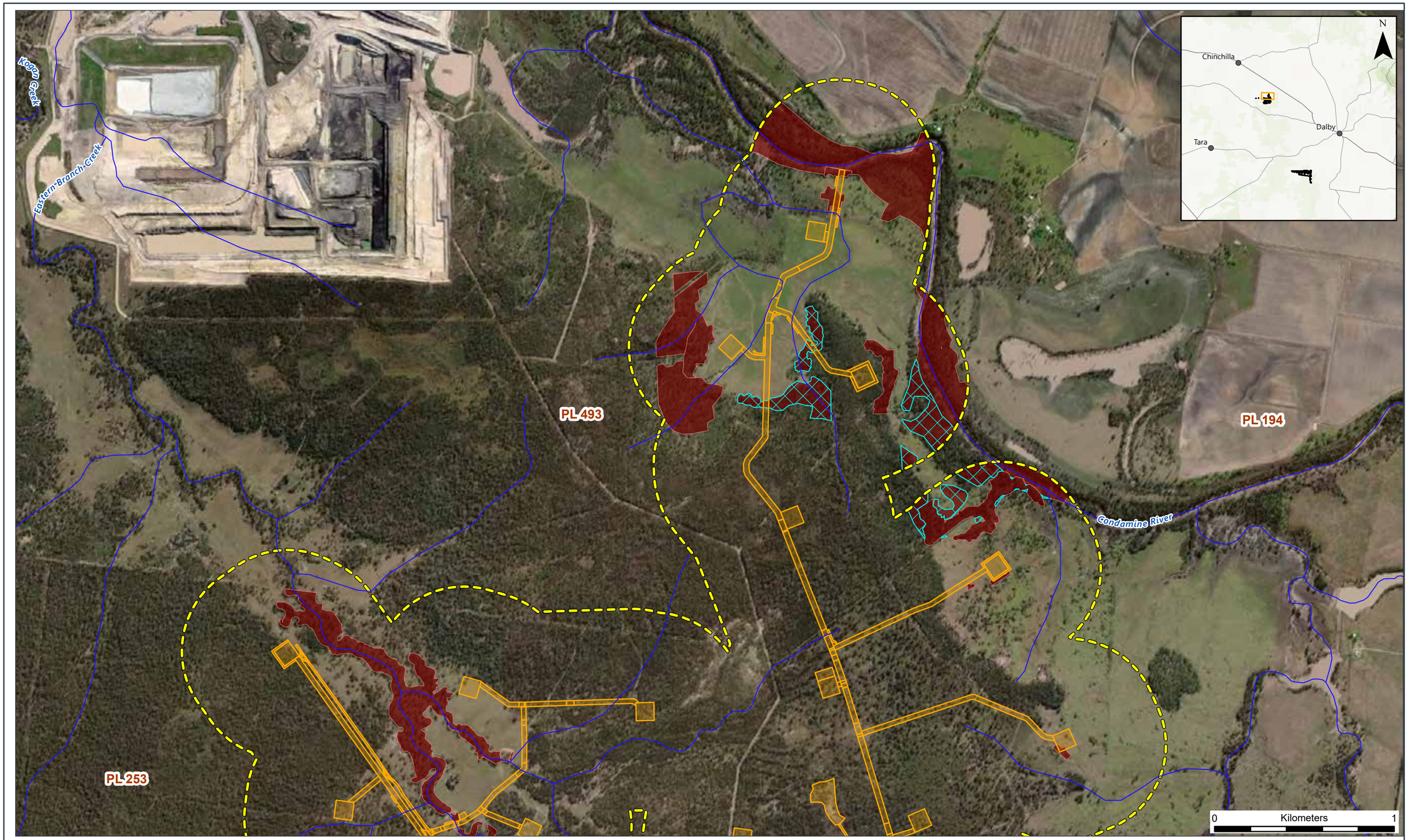

Conservation-significant Fauna - Invertebrates (Page 2 of 6)

SGP SOUTH

- Brigalow Woodland Snail Record
- Pale Imperial Hairstreak Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Brigalow Woodland Snail Potential Habitat
- Pale Imperial Hairstreak Potential Habitat

Attexo

REVIEWED: JC **DRAWN:** JT **SCALE (A3):** 1:20,000 **DATE:** 10/03/2025 **DWG No:** ARR-002_128[C] **FIGURE 3.10**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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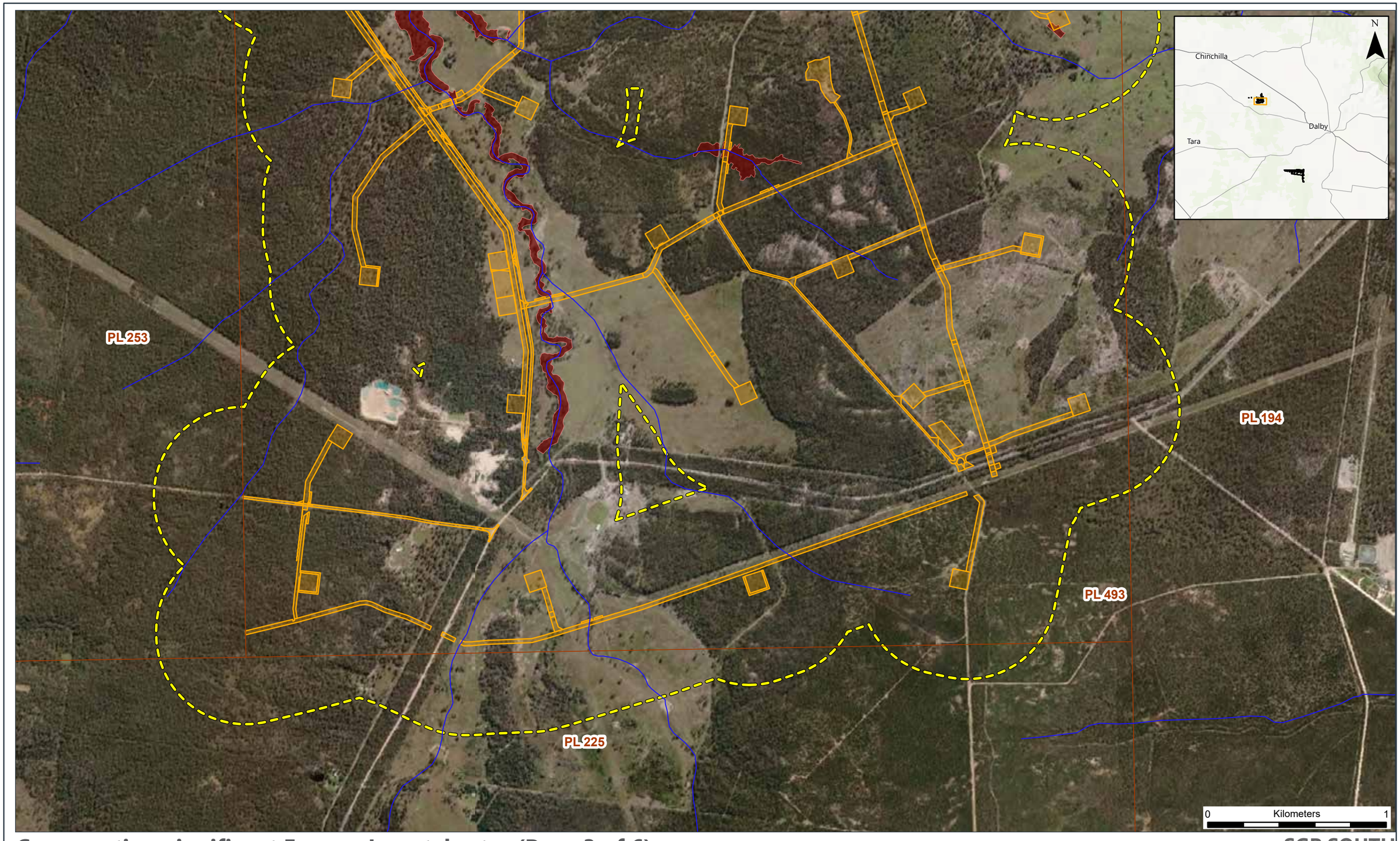

Conservation-significant Fauna - Invertebrates (Page 3 of 6)

SGP SOUTH

- Brigalow Woodland Snail Record
- Pale Imperial Hairstreak Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Brigalow Woodland Snail Potential Habitat
- Pale Imperial Hairstreak Potential Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 10/03/2025 | **DWG No:** ARR-002_128[C] | **FIGURE 3.10**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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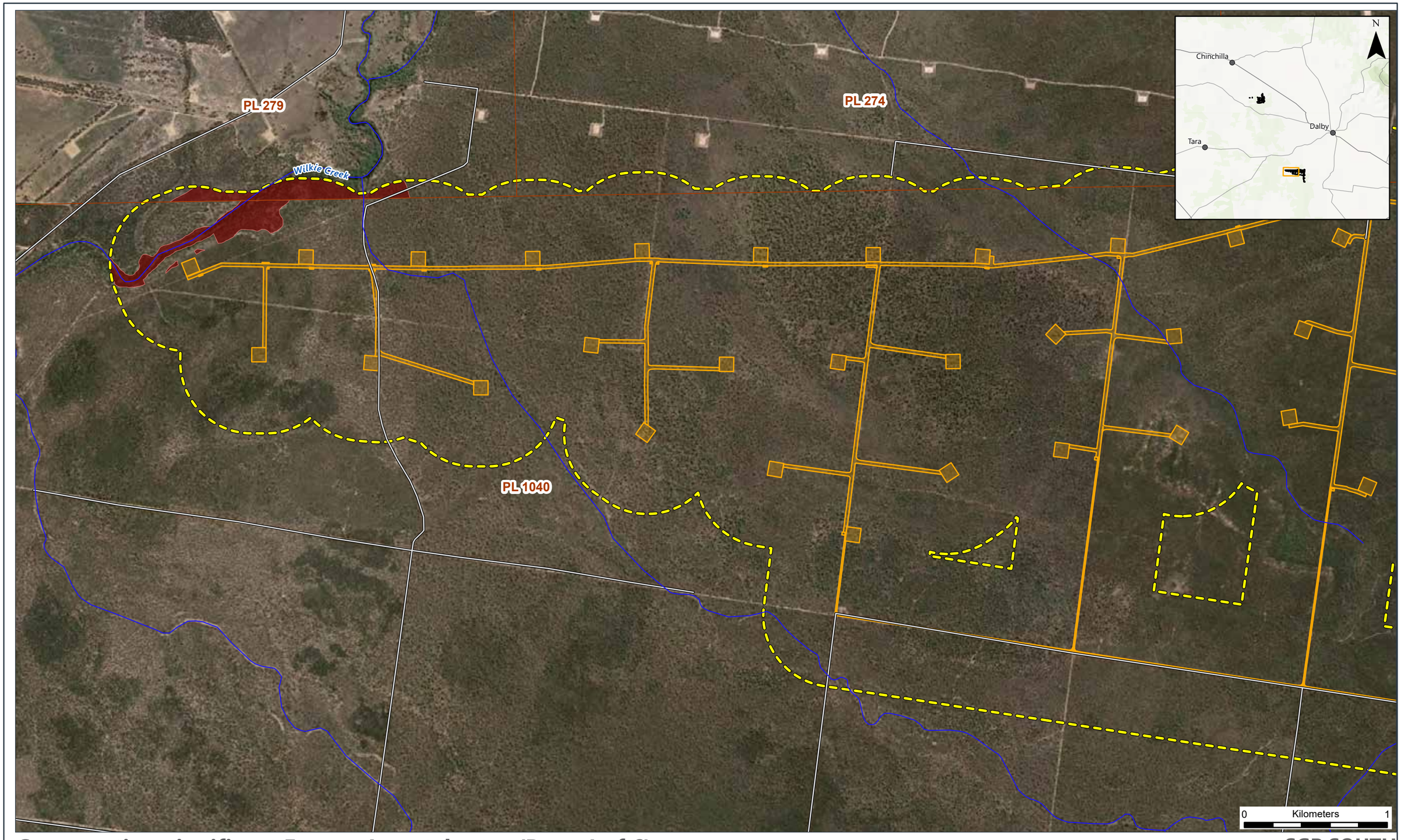

Conservation-significant Fauna - Invertebrates (Page 4 of 6)

SGP SOUTH

- Brigalow Woodland Snail Record
- Pale Imperial Hairstreak Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Brigalow Woodland Snail Potential Habitat
- Pale Imperial Hairstreak Potential Habitat

Attexo

REVIEWED: JC **DRAWN:** JT **SCALE (A3):** 1:25,000 **DATE:** 10/03/2025 **DWG No:** ARR-002_128[C] **FIGURE 3.10**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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Conservation-significant Fauna - Invertebrates (Page 5 of 6)

SGP SOUTH

- Brigalow Woodland Snail Record
- Pale Imperial Hairstreak Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Brigalow Woodland Snail Potential Habitat
- Pale Imperial Hairstreak Potential Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 10/03/2025 | **DWG No:** ARR-002_128[C] | **FIGURE 3.10**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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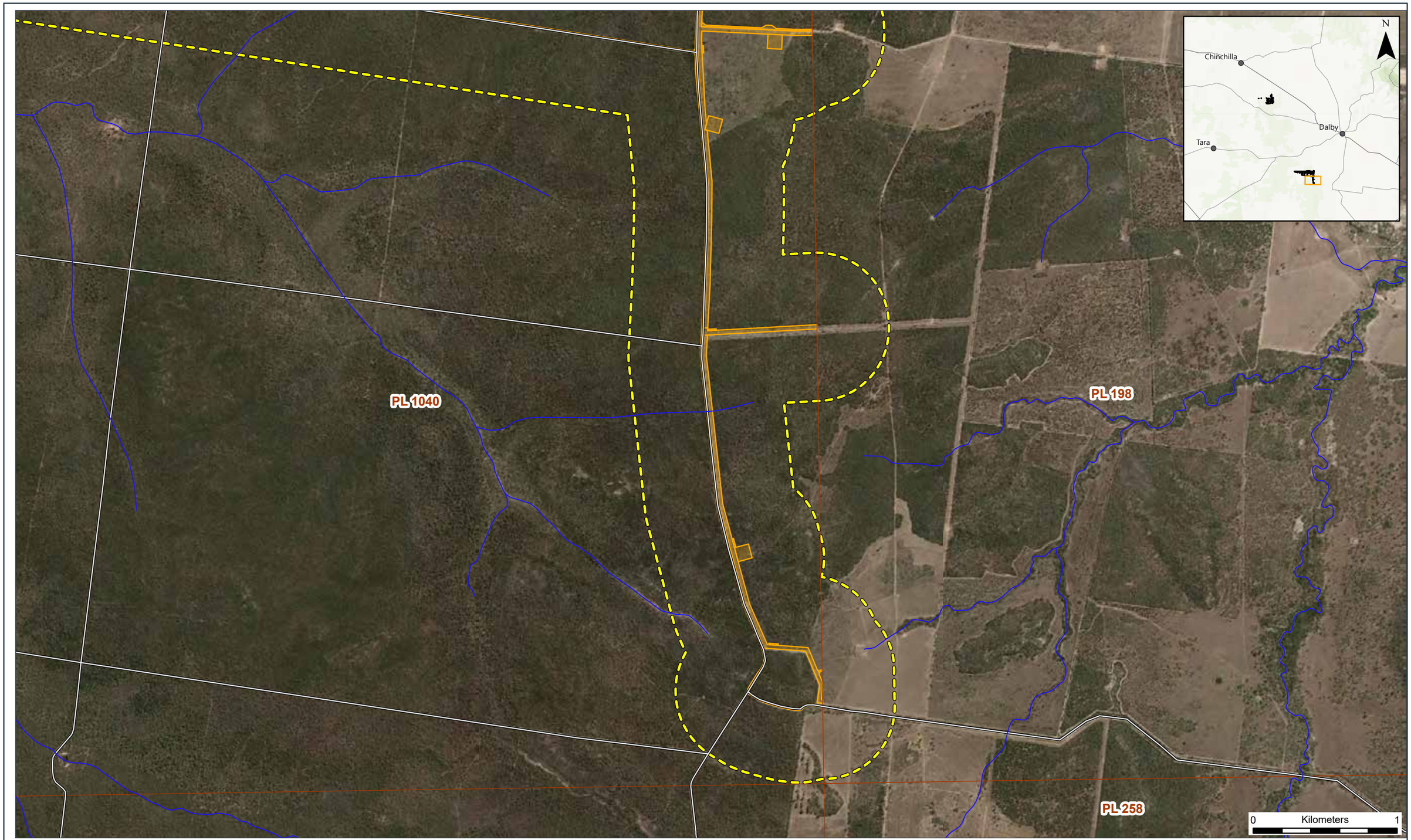

Conservation-significant Fauna - Invertebrates (Page 6 of 6)

SGP SOUTH

- Brigalow Woodland Snail Record
- Pale Imperial Hairstreak Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Brigalow Woodland Snail Potential Habitat
- Pale Imperial Hairstreak Potential Habitat

Attexo

REVIEWED: JC **DRAWN:** JT **SCALE (A3):** 1:25,000 **DATE:** 10/03/2025 **DWG No:** ARR-002_128[C] **FIGURE 3.10**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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3.3.4.7 Koala, *Phascolarctos cinereus*

This species is common in the landscape surrounding the Study area, and a single record has been identified within the southern portion of the Study area (ALA, 2009) in RE 11.7.4. Koalas are well represented in the broader SGP area, within over 700 records within 50 km including numerous records within the Study area and in all surrounding directions. Closer to the western extent of their distribution, Koalas are often associated with watercourses, though they are not restricted to them (DAWE, 2022a). They are not strongly territorial and home ranges will overlap. Home ranges vary in size from 1-2 ha in optimum habitat up to 135 ha in semi-arid regions (DAWE, 2022a). Koalas are surprisingly mobile and able to move large distances across artificial (cleared) land. There are no limitations on patch size, and they are also often seen in regrowth vegetation. The abundance of records in non-remnant habitats likely reflect these behaviours with individuals able to utilise isolated trees in an otherwise unsuitable landscape.

Koalas feed on eucalypt trees but show dietary preference based on geographical region and the types of tree species present. In the Brigalow Belt, Koalas have at least 24 species of *Eucalyptus* on which they preferentially forage (Australian National University, 2021). Of these tree species, the following have been recorded in the broader SGP: *Corymbia tessellaris*, *C. citriodora*, *Eucalyptus camaldulensis*, *E. chloroclada*, *E. coolabah*, *E. crebra*, *E. exserta*, *E. fibrosa*, *E. melanophloia*, *E. moluccana*, *E. ochrophloia*, *E. populnea* and *E. tereticornis*.

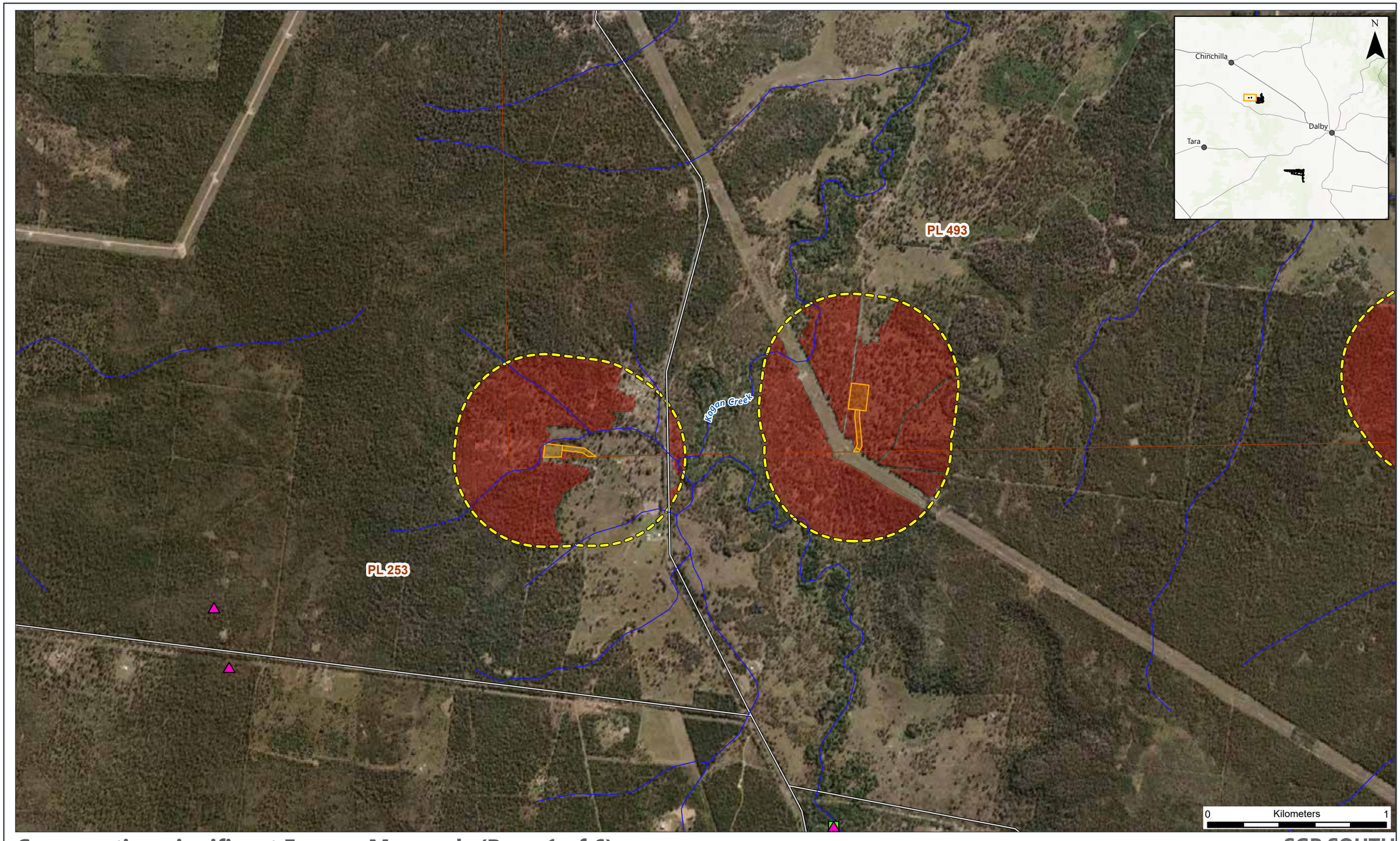
Analysis of available spatially accurate recent (1975+) records across the broader SGP identifies their presence in a wide range of BVGs that correspond to many of the REs present. While some identified REs do not appear to contain eucalypts on the basis of their description, closer inspection of the REDD reveals that emergent eucalypts are often present. Based on REDD, potential foraging trees are present in all remnant types except RE 11.9.5 (EcoSmart, 2023).

Potentially suitable habitat within the Study area is shown in **Figure 3.11**.

3.3.4.8 Short-beaked Echidna, *Tachyglossus aculeatus*

The Short-beaked Echidna lives in forests and woodlands, heaths, grasslands and arid environments (BHA, 2024). Several records of the Short-beaked Echidna (*Tachyglossus aculeatus*) have been identified in the region surrounding the Study area, with several records occurring within 2 km (Arrow, 2024). Considering the broad range of habitats that the Echidna could occupy, they could occur anywhere across the Study area. For the purposes of this assessment, habitat has been mapped by buffering known records by 1 km as set out in the Method for mapping matters of state environmental significance, Version 7 (DESI, 2024).

Potentially suitable habitat and the location of nearby records for this species have been shown on **Figure 3.11**.



Conservation-significant Fauna - Mammals (Page 1 of 6)

SGP SOUTH

- Koala Record
- Short-beaked Echidna Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Koala Potenital Habitat

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FIGURE 3.11

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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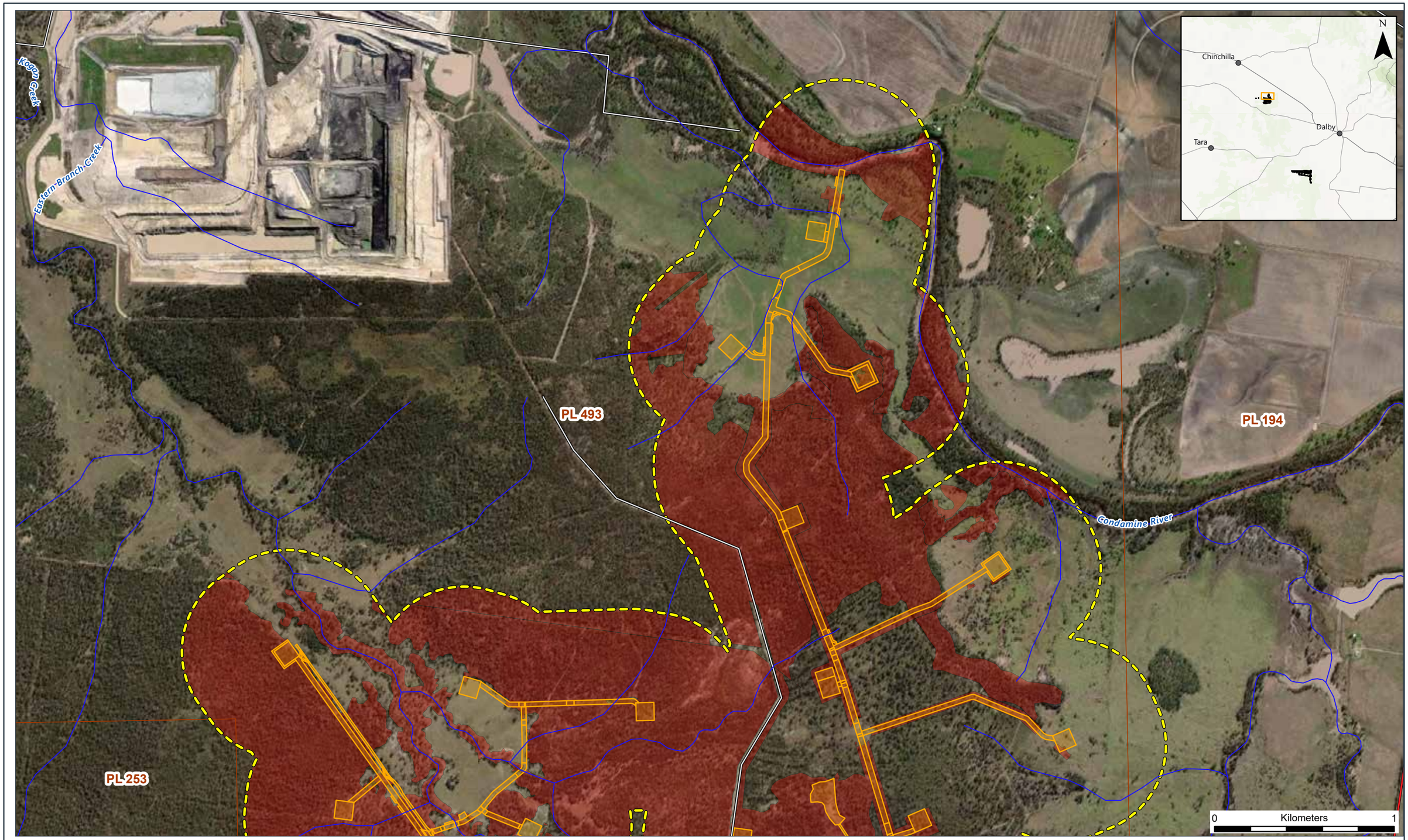

Conservation-significant Fauna - Mammals (Page 2 of 6)

SGP SOUTH

- Koala Record
- Short-beaked Echidna Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Koala Potenital Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_127[C] | **FIGURE 3.11**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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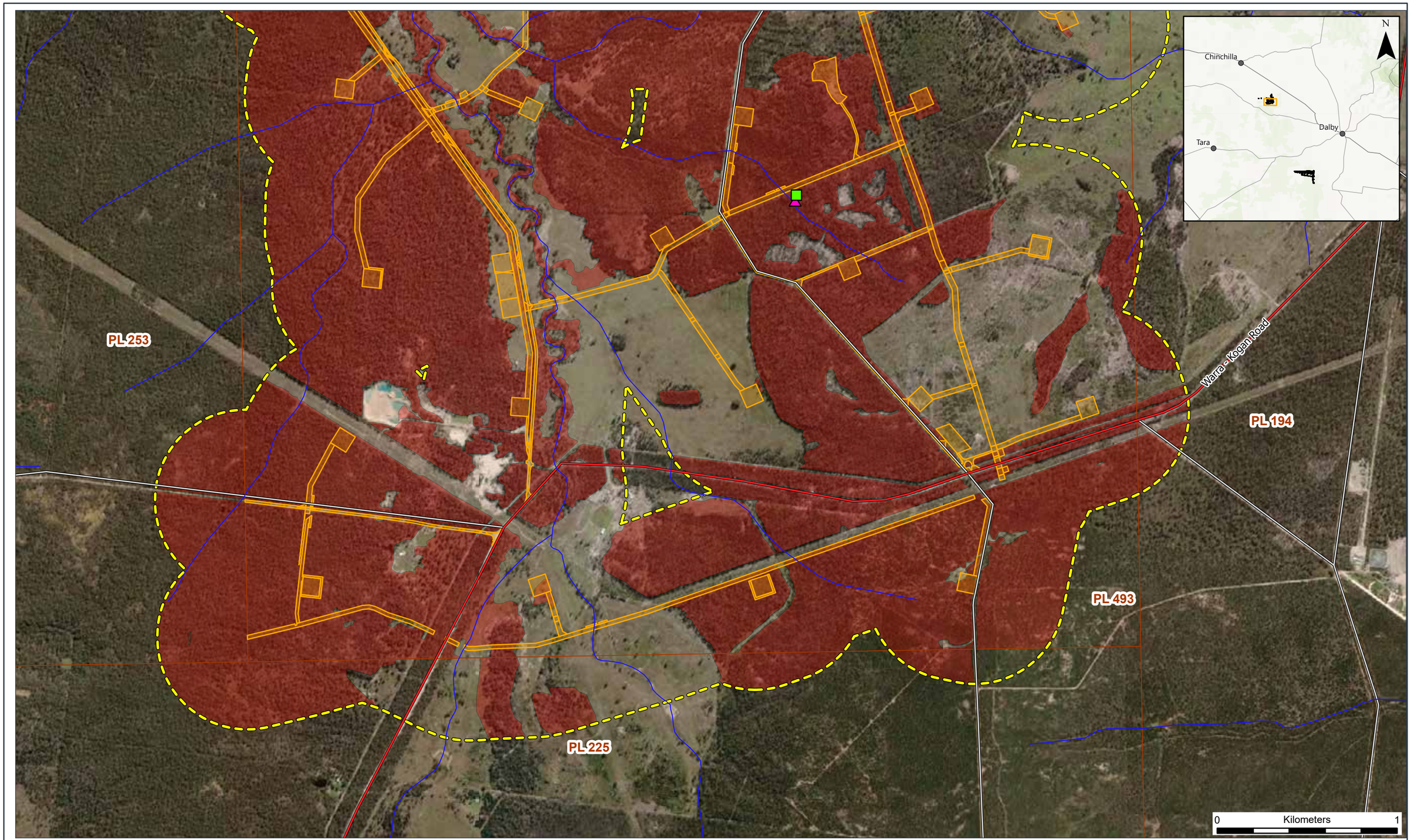

Conservation-significant Fauna - Mammals (Page 3 of 6)

SGP SOUTH

- Koala Record
- Short-beaked Echidna Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Koala Potenital Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_127[C] | **FIGURE 3.11**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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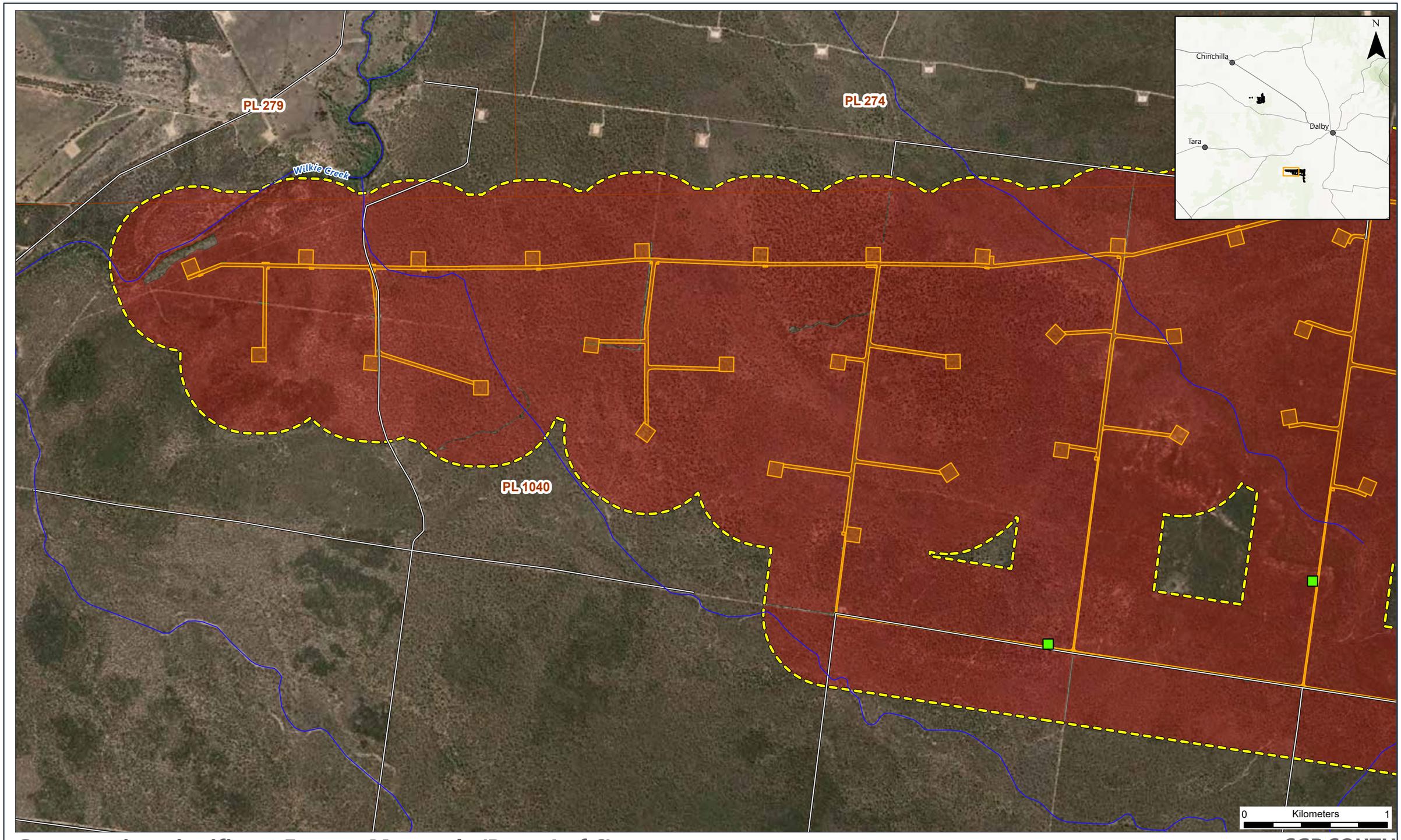

Conservation-significant Fauna - Mammals (Page 4 of 6)

SGP SOUTH

- Koala Record
- Short-beaked Echidna Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Koala Potenital Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_127[C] | **FIGURE 3.11**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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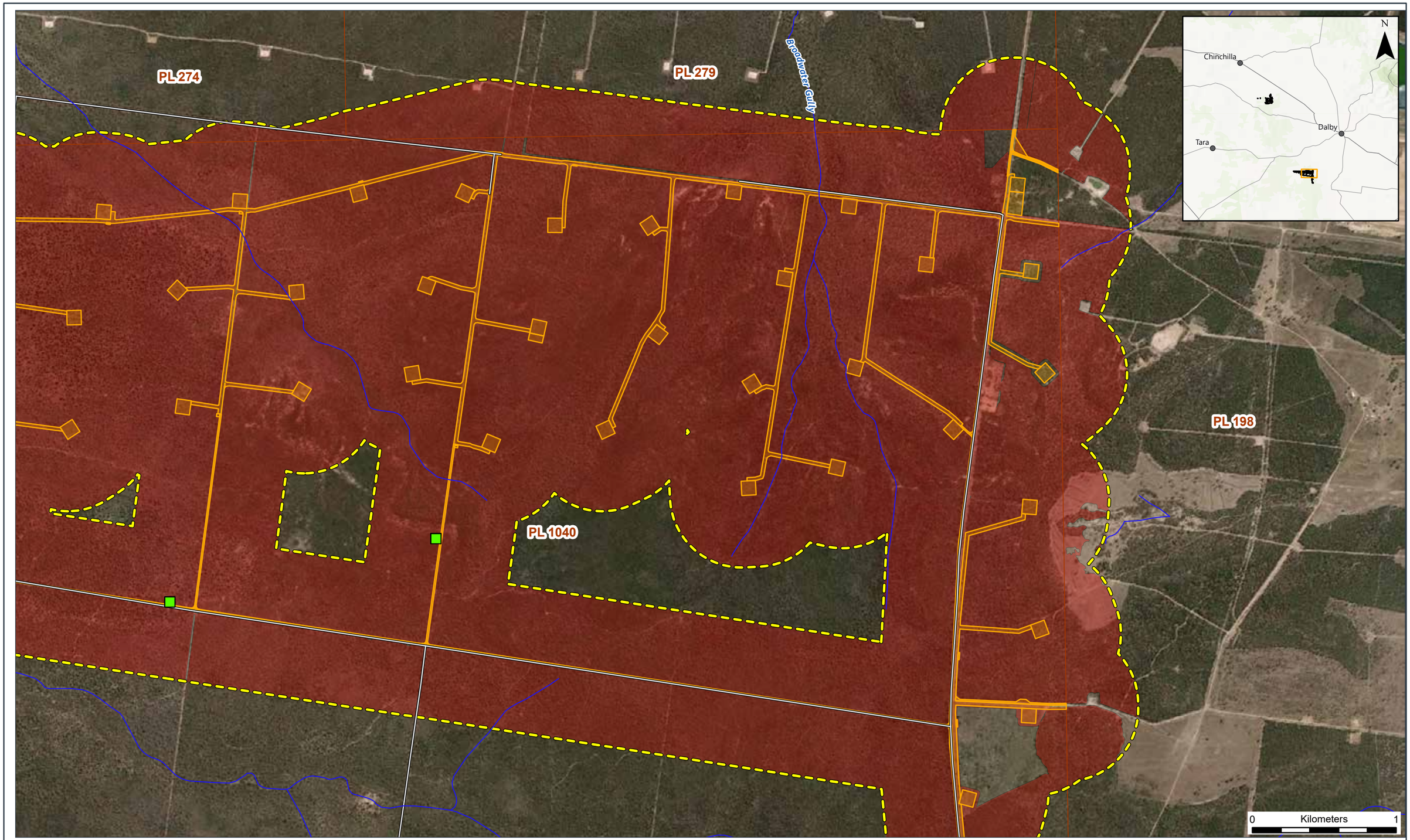

Conservation-significant Fauna - Mammals (Page 5 of 6)

SGP SOUTH

- Koala Record
- Short-beaked Echidna Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Koala Potenital Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_127[C] | **FIGURE 3.11**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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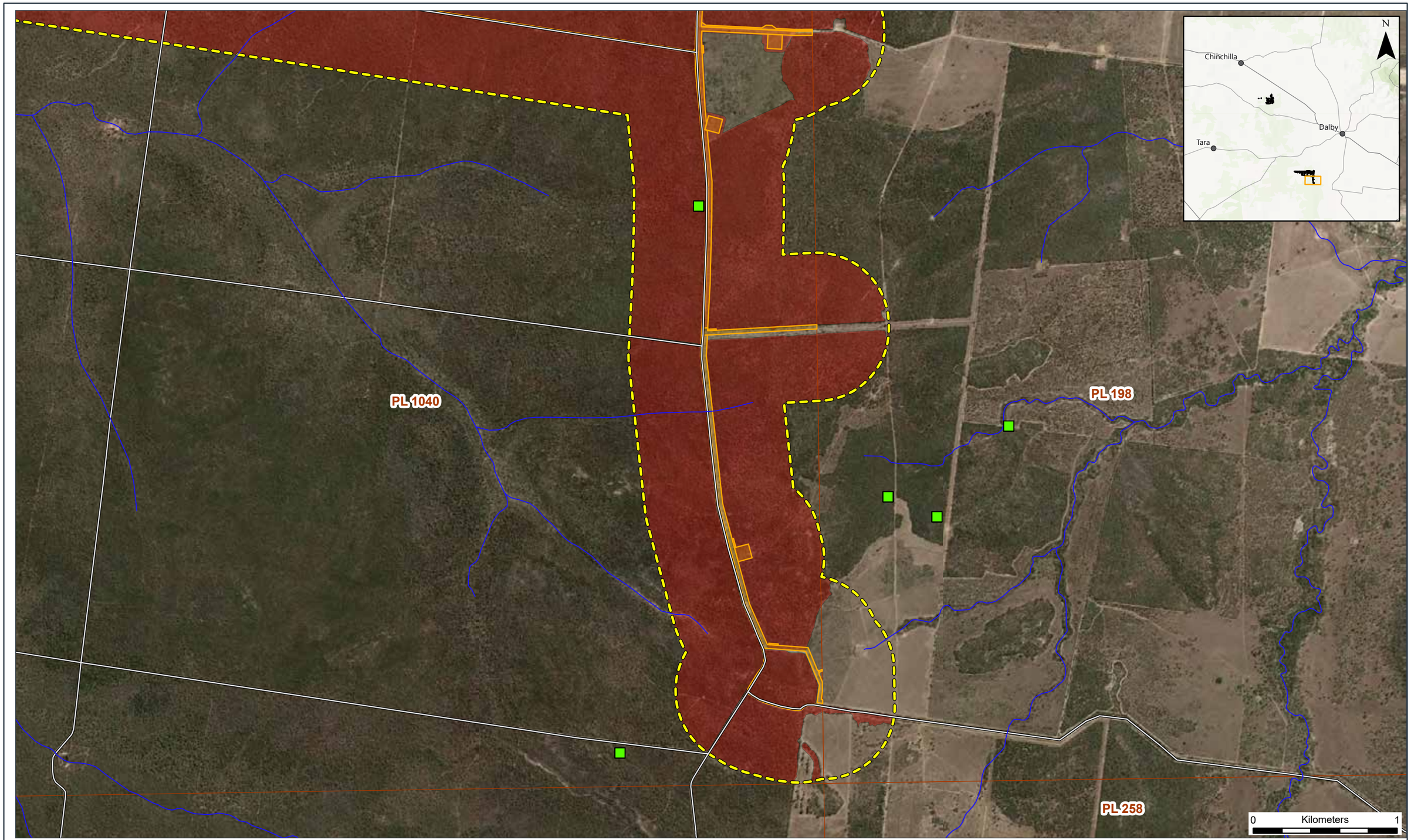

Conservation-significant Fauna - Mammals (Page 6 of 6)

SGP SOUTH

- Koala Record
- Short-beaked Echidna Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Koala Potenital Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_127[C]

FIGURE 3.11

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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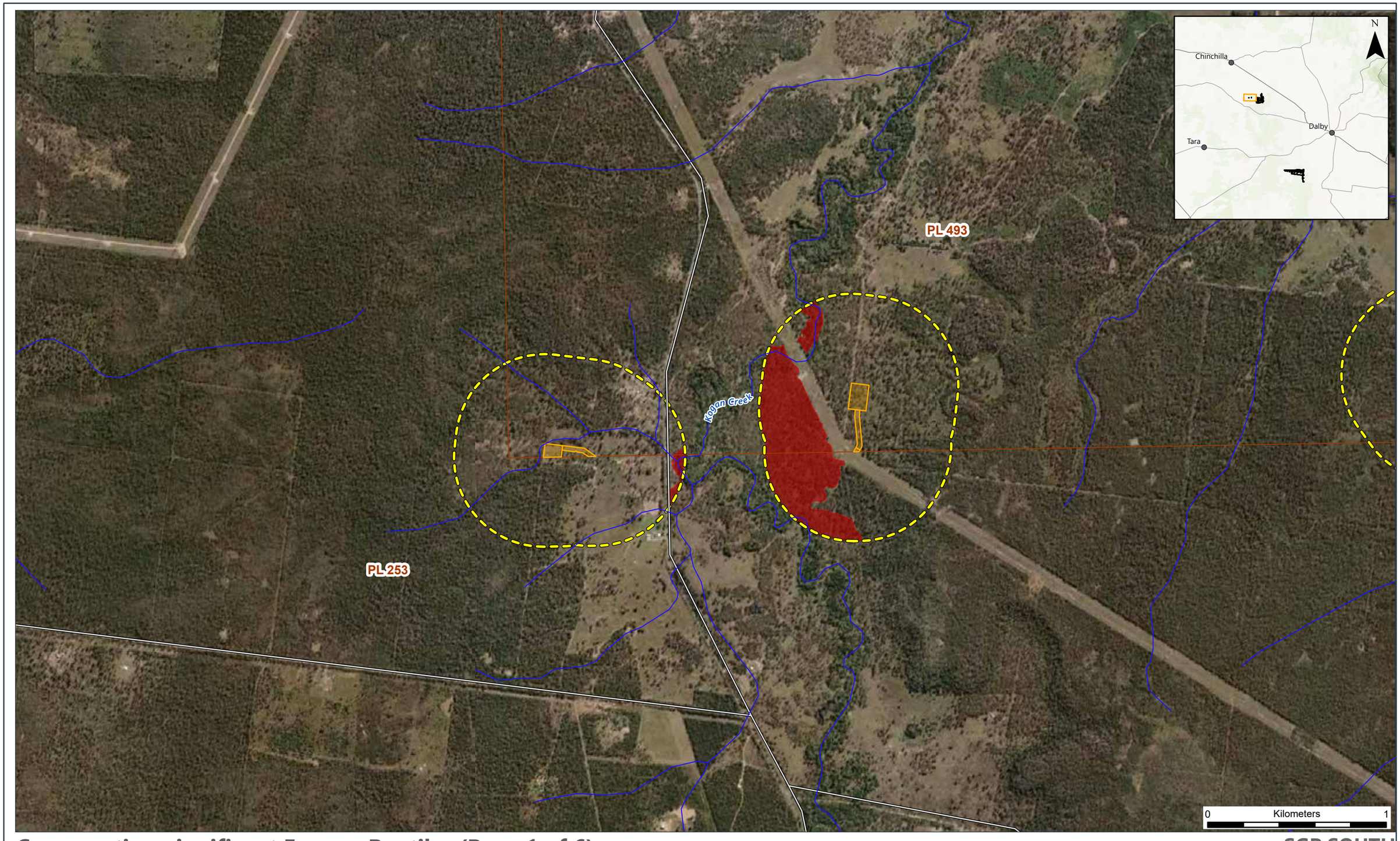
3.3.4.9 Grey Snake, *Hemiaspis damelii*

Grey Snake potentially occurs from southern, inland New South Wales to south-eastern Queensland (Cogger, 2018). However, the conservation advice indicates that the occurrence in New South Wales is represented by heavily fragmented, isolated areas, rather than continuous distribution as indicated by the Cogger distribution map (DCCEEW, 2022c). In Queensland, Grey Snake distribution is more widespread, with a concentration of records of the species along the Macintyre and Condamine Rivers and associated floodplains of the southern Brigalow Belt from Goondiwindi and Dalby west to Glenmorgan on the Darling Downs and western Lockyer Valley. The closest record of this species is within vegetation approximately 3 km to the east of the southern portion of the Study area (Arrow, 2024). Multiple records have also been identified at Lake Broadwater and along the Condamine River floodplain.

Grey Snakes occur in dry sclerophyll forests and woodlands throughout their range and are normally found under cover during the day but are only partly nocturnal (Cogger, 2018). In Queensland, habitat is specifically in Brigalow (*Acacia harpophylla*) and Belah (*Casuarina cristata*) woodlands on heavy, dark brown to black cracking clay soils, particularly in association with water bodies, areas with small gullies and ditches, and floodplain environments. Logs, rocks and soil cracks provide important cover requirements for the species. Primary prey for this species is frogs, thus the floodplains and ephemeral water features that support the prey are important habitat for Grey Snake.

EcoSmart identified that Grey Snakes within the vicinity of the Study area are primarily associated with RE 11.5.20, and RE 11.7.4/11.7.7. However, most records within 50 km are associated with non-remnant habitats, suggesting that this species is less influenced by dominant vegetation type than microhabitat features (EcoSmart, 2023). Considering this, potentially suitable habitat mapping for this species has incorporated the following RE communities: RE 11.3.2, 11.3.4, 11.3.14, 11.3.18, 11.3.25, 11.4.3, 11.4.3a. These communities reflect those that could collect water and provide potential habitat for this species.

Potentially suitable habitat for this species within the Study area is shown on **Figure 3.12**.



Conservation-significant Fauna - Reptiles (Page 1 of 6)

SGP SOUTH

- Grey Snake Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Grey Snake Potential Habitat

Attexo

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FIGURE 3.12

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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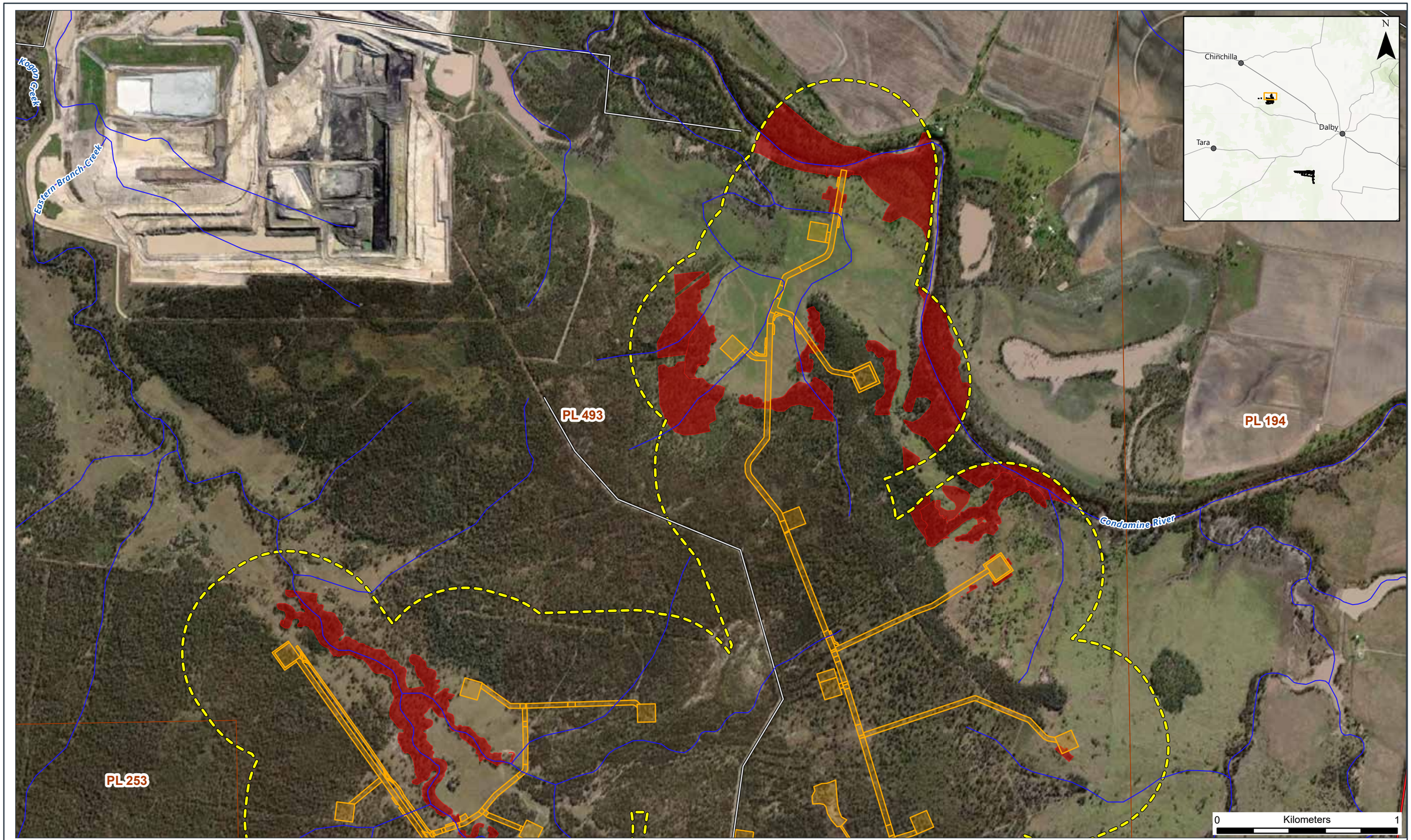

Conservation-significant Fauna - Reptiles (Page 2 of 6)

SGP SOUTH

- Grey Snake Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Grey Snake Potential Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_129[C] | **FIGURE 3.12**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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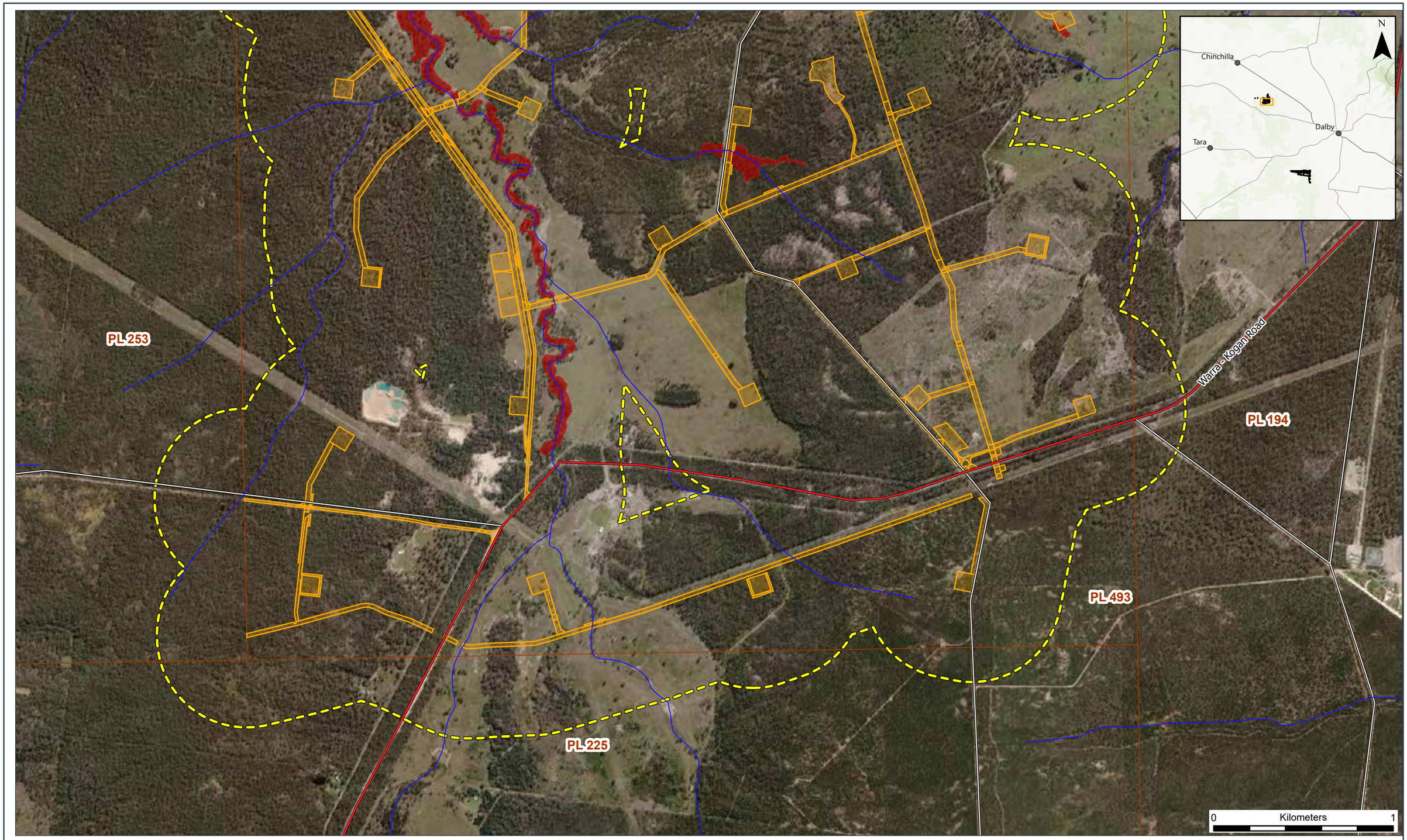

Conservation-significant Fauna - Reptiles (Page 3 of 6)

SGP SOUTH

- Grey Snake Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Grey Snake Potential Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:20,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_129[C] | **FIGURE 3.12**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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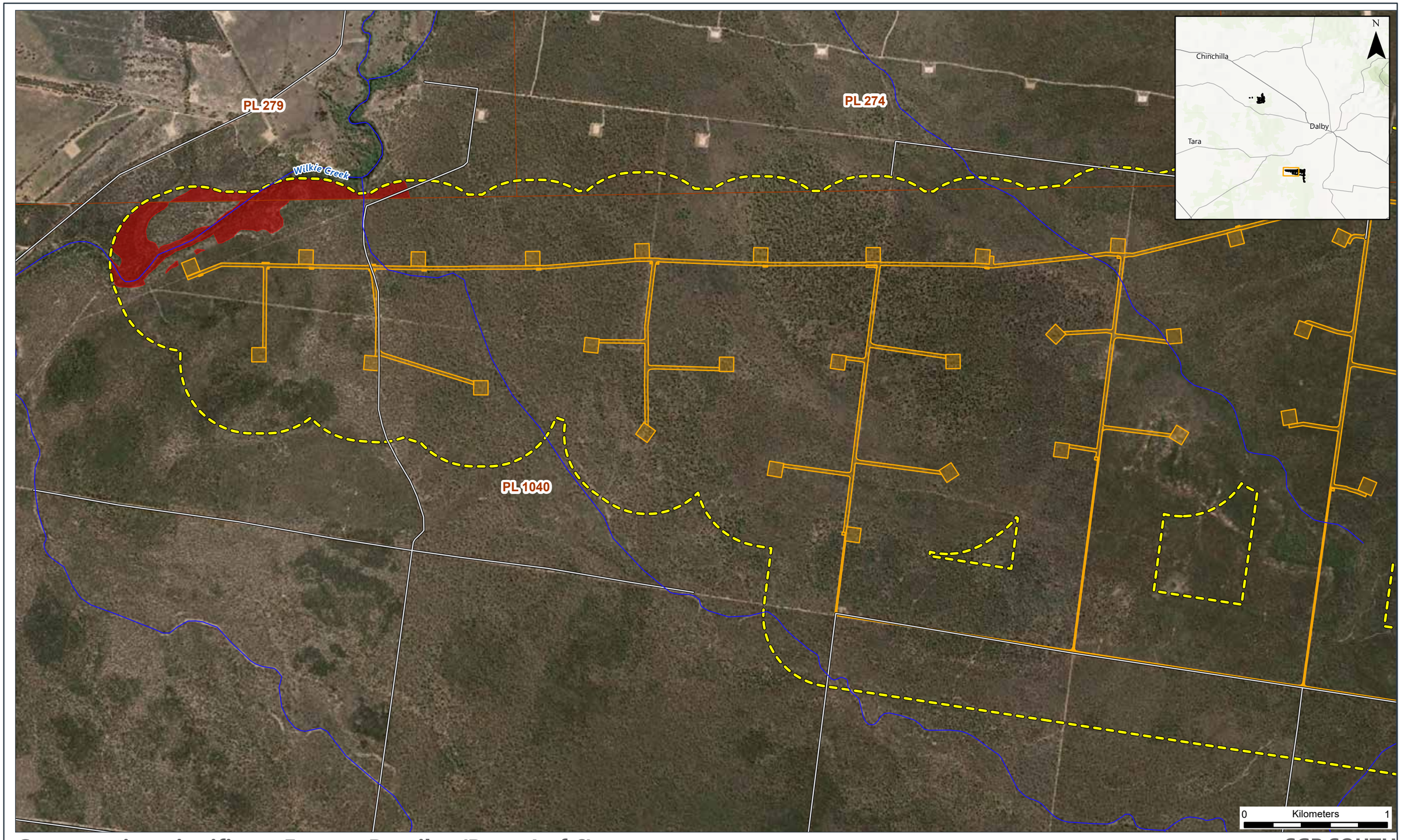

Conservation-significant Fauna - Reptiles (Page 4 of 6)

SGP SOUTH

- Grey Snake Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Grey Snake Potential Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_129[C] | **FIGURE 3.12**

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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Conservation-significant Fauna - Reptiles (Page 5 of 6)

SGP SOUTH

- Grey Snake Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Grey Snake Potential Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_129[C]

FIGURE 3.12

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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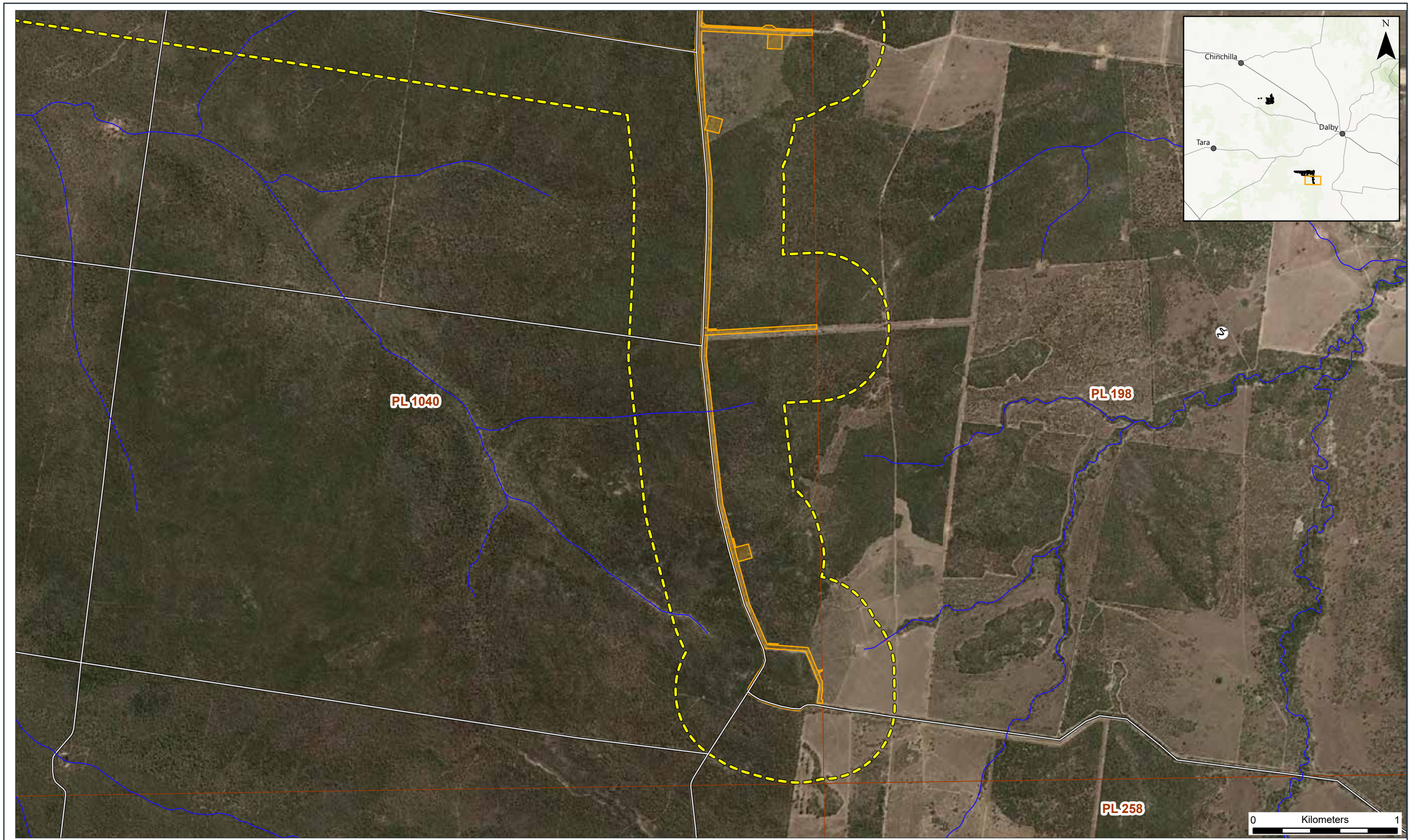

Conservation-significant Fauna - Reptiles (Page 6 of 6)

SGP SOUTH

- Grey Snake Record
- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- PL granted
- Grey Snake Potential Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:25,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_129[C]

FIGURE 3.12

GDA2020 MGA Zone 56

Data Source: World Imagery: Earthstar Geographics
World Topographic Map:
World Hillshade: Esri, USGS

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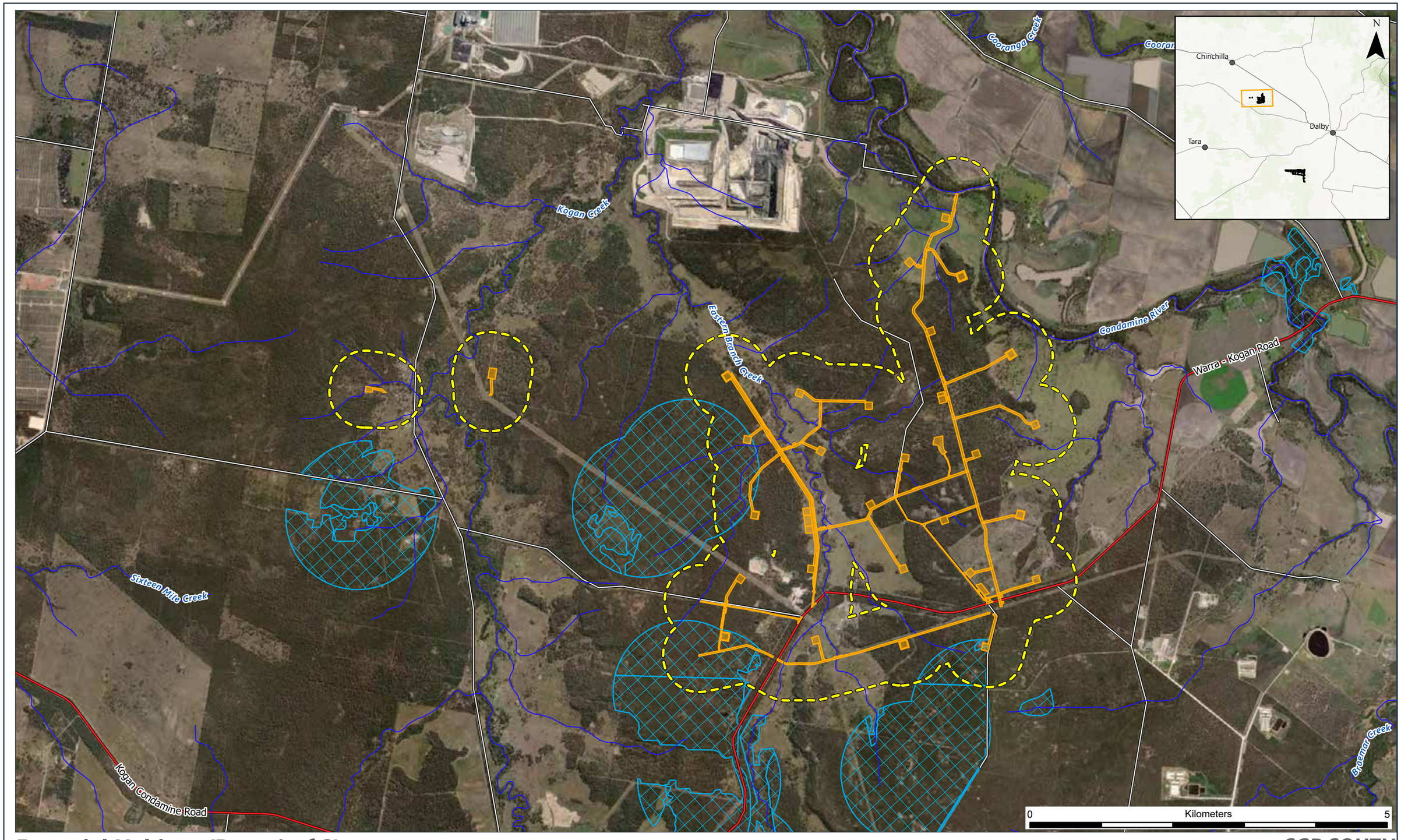
3.3.5 Near Threatened fauna species

Golden-tailed Gecko (*Strophurus taenicauda*) is likely to occur in the Study area. Habitat for a near threatened species does not constitute an ESA, nor is it a PEM under the EO Act. The presence or potential presence of a near threatened species triggers requirements under the NC Act that are approved and managed separately to the EA. Therefore, the occurrence or potential occurrence of near threatened species or their habitat does not trigger any requirement to amend the SGP South EA however, the presence of these species is noted.

3.3.6 Essential habitat mapping

Mapped Essential habitat occurs within the Study area for the following (refer to **Figure 3.13**):

- Mapped essential habitat for endangered species:
- *Philotheca sporadica* (Kogan Waxflower) (Lot 56 on DY71, Lot 25 on DY249, Lot 50 on DY70, Lot 10 on RP166603, Lot 2 on SP207408, Lot 55 on DY71 and Lot 11 on RP166603); and
- Phascolarctos cinereus (Koala) (Lot 28 on DY22).
- Mapped essential habitat for vulnerable species:
- *Petaurus australis australis* (Yellow-bellied Glider (southern subspecies)) (Lot 2 on SP207408, Lot 10 on RP166603 and Lot 11 on RP166603).



Essential Habitat (Page 1 of 2)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- Mapped Essential Habitat

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FIGURE 3.13

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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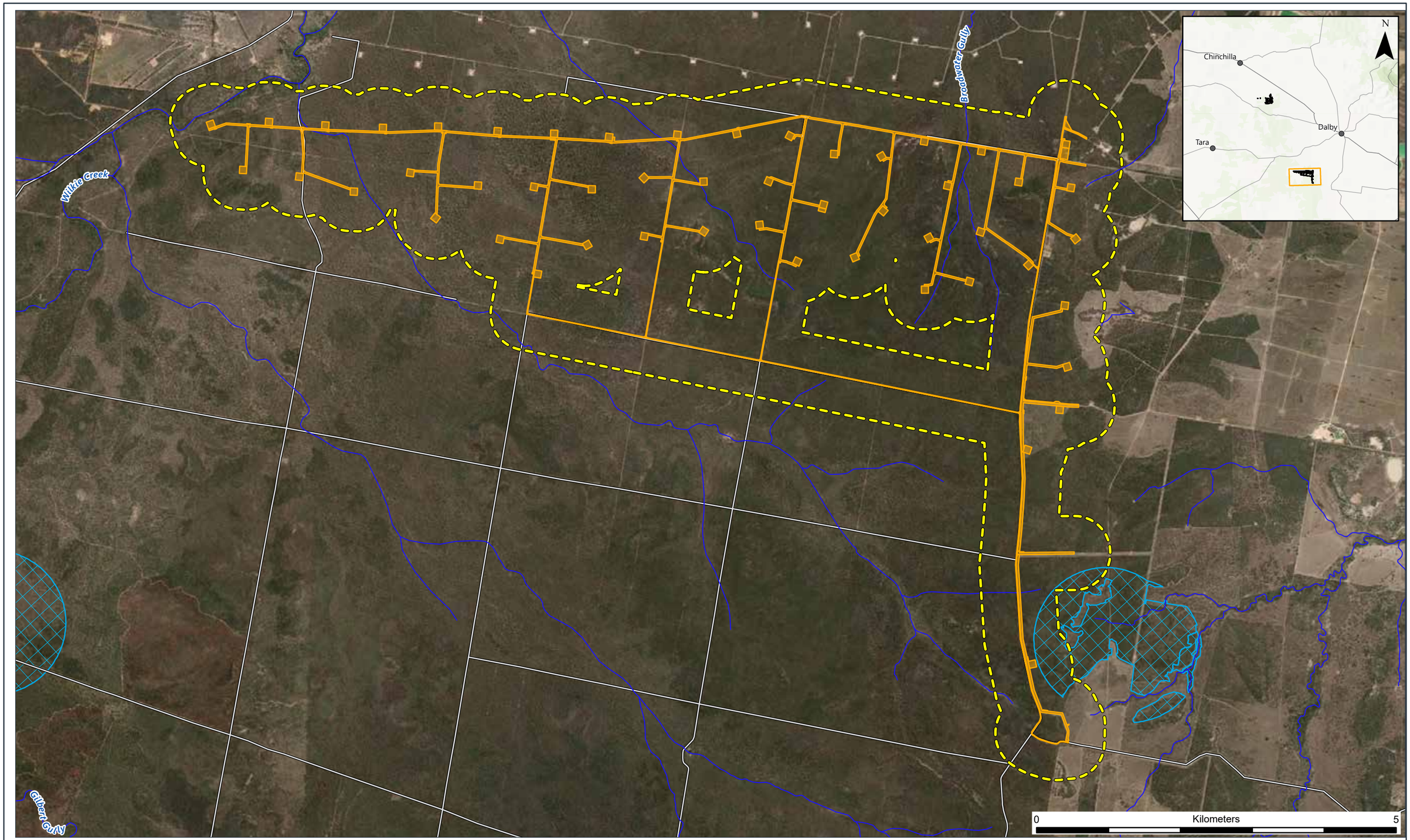

Essential Habitat (Page 2 of 2)

SGP SOUTH

- Watercourse
- Highway
- Main Road
- Local Road
- Study Area (500m Buffer)
- Project Footprint
- Mapped Essential Habitat

Attexo

REVIEWED: JC | **DRAWN:** JT | **SCALE (A3):** 1:50,000 | **DATE:** 30/01/2025 | **DWG No:** ARR-002_130[C] | **FIGURE 3.13**

GDA2020 MGA Zone 56

Data Source: World Imagery: Maxar
World Topographic Map:
World Hillshade: Esri, USGS

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4.0 Impact assessment

4.1 Planning and design

Coal seam gas developments apply an iterative process in terms of locating wells and gathering lines to manage competing constraints associated with the location of surface infrastructure, including ecological values, landholder preferences, geological features, existing infrastructure, and access tracks. Planning and management of surface activities and ground disturbance is undertaken utilising a set of hierarchical management principles to avoid, minimise and mitigate impacts to environmental values. These principles are:

- Avoid: Arrow's first preference is to avoid PEMs, threatened ecological communities and threatened species habitat.
- Minimise: where other competing constraints or the scale / location of PEMs communities or species habitat dictate that avoidance is not possible (e.g. where there is riparian vegetation that need to be crossed or large areas of suitable habitat for wide ranging species such as the Koala, Greater Glider or Painted Honeyeater), Arrow will preferentially locate infrastructure in a manner that minimises the impact to these values (e.g. cross the riparian vegetation at the narrowest or most degraded part or where practicable on the edge of suitable habitat for listed species so as not to bisect good quality habitat).
- Mitigate: implement mitigation measures to further minimise the direct and indirect impacts on ecological values.
- Remediate and rehabilitate: actively remediate and rehabilitate impacted areas to promote and maintain long term recovery.
- Offset: Arrow will offset unavoidable significant residual impacts to PEMs.

The Study area retains significant native vegetation cover compared with other parts of the Brigalow Belt bioregion, with approximately 77% of the total land area (7,885 ha) supporting remnant native vegetation and a further 6% supporting regrowth and other non-remnant vegetation. As such, it is not possible to access the gas resource for SGP South without clearing remnant vegetation. The implementation of the mitigation hierarchy has limited impacts to remnant vegetation in the Project footprint to only 58% of the total disturbance area.

4.1.1 Field development layout

The proposed field development layout has been designed using the management hierarchy as described in **Section 4.1**. The proposed flowlines and other linear infrastructure are co-located adjacent to existing infrastructure or in disturbed areas as much as possible to avoid fragmenting vegetated areas which also allows for less temporary construction disturbance. There is also a multi-well site in the Kogan Creek project area (north west of the Study area) that reduces surface disturbance. There are a number of significant planning and access constraints that have also influenced the proposed field layout and limited the choice of infrastructure locations. For example, the Warra-Kogan Road and Eastern Branch Creek.

4.1.2 Waterway crossing methodologies

A range of pipeline construction methods are available for watercourse crossings, including standard 'open cut' trenching, watercourse flow diversion and trenchless technology. A brief description of each and the associated advantages and disadvantages is provided below:

- standard 'open cut' trenching involves in-stream construction of a trench using excavators or backhoes to stockpile trench spoil away from the streambed. The prefabricated pipe is placed across the waterway, lowered in and the trench backfilled immediately. This method is often applied in dry or shallow low flow watercourses but may also be applied in sensitive watercourses where rapid construction is the best means of minimising environmental impacts.
- watercourse flow diversion techniques involve construction of temporary dams up and downstream of a crossing and the diversion of water around the crossing site to create a dry construction area between the dams. This method is generally applied at crossings where water flow is required to be maintained for ecological, social or engineering reasons.
- trenchless options, such as horizontal directional drilling (HDD) can cause less disruption to the surface environment and can be a viable alternative where there are significant surface constraints that exclude standard open cut trenching as a construction methodology. However, the cost of HDD is significantly higher compared to standard trenching and there are technical constraints and environmental risks (e.g. HDD failure, accidental release of drilling muds where geology is uncohesive, etc) that also need to be considered. A cleared area equivalent to the length of the HDD is also required to 'string' the pipe length (i.e. welding together all sections of the pipe that are then pulled through the HDD). Other technical considerations include are not limited to, ground conditions and depth of channels.

All pipe crossings will use standard 'open cut' trenching methods and the use of bed-level crossings will be undertaken in accordance with the accepted development requirements (ADR) of the waterway barrier (WWB) self-assessable code or the temporary WWB code.

4.2 Overview of impacts

4.2.1 Vegetation clearing

The most significant impact associated with the development of Study area is the direct loss of the following resulting from the establishment of well pads, gathering and associated infrastructure:

- approximately 178.1 ha of remnant vegetation (representing approximately 2.9 % of the total remnant vegetation within the Study area); and
- approximately 63.7 ha of native regrowth vegetation (representing approximately 13.1% of the total regrowth vegetation in the Study area).

Given the highly vegetated nature of the Study area, clearing of remnant vegetation and associated habitat is an unavoidable aspect of the Project development however, the majority of the clearing proposed is in widespread, least concern vegetation types (predominantly RE 11.5.1, 11.5.20, 11.7.4 and 11.7.7). **Table 4.1** summarises the total area of remnant and regrowth vegetation in the areas to be disturbed by the Project.

Table 4.1 Vegetation clearing for SGP South by RE type

RE Type	VM Act Status	Biodiversity Status	Impact area (ha)
Remnant			
11.3.1	Endangered	Endangered	0.3
11.3.25	Least concern	Of concern	0.2
11.5.1	Least concern	No concern at present	80.2
11.5.1a	Least concern	No concern at present	0.4
11.5.20	Least concern	No concern at present	19.0
11.5.4	Least concern	No concern at present	6.9
11.7.4	Least concern	No concern at present	49.8
11.7.5	Least concern	No concern at present	2.3
11.7.7	Least concern	No concern at present	19.0
		Subtotal (remnant)	**178.1**
Regrowth			
11.3.2 Regrowth	Of concern	Of concern	0.3
11.3.25 Regrowth	Least concern	Of concern	0.0
11.4.3 Regrowth	Endangered	Endangered	0.1
11.5.1 Regrowth	Least concern	No concern at present	12.8
11.5.4 Regrowth	Least concern	No concern at present	7.2
11.7.4 Regrowth	Least concern	No concern at present	12.3
11.7.7 Regrowth	Least concern	No concern at present	12.0
Undifferentiated			19.0
		Subtotal (regrowth)	**63.7**
Cleared and non-remnant			
Cleared land	-	-	49.1
Derived grassland	-	-	14.9
		Total clearing	**305.8**

4.2.2 Habitat fragmentation and landscape connectivity

Habitat fragmentation occurs when continuous areas of habitat are subdivided into a number of smaller, separate components. This term encompasses two interrelated components; habitat loss (i.e. a reduction in the amount of habitat) and fragmentation (i.e. the breaking apart of habitat which increases 'edge effects') (Bennet, 2006). The impacts of habitat fragmentation are scale-dependent and may differ depending on the species or community under consideration. For example, loss of small areas of habitat that do not present a significant barrier to movement by highly mobile species (e.g. birds of prey) may represent a much greater barrier to dispersal of less mobile or far-ranging species (e.g. amphibians or small reptiles).

While the overall clearing areas are large, clearing within remnant vegetation for gas field developments is undertaken in 'chunks', with disturbance areas of approximately 1 ha for individual well pads or linear corridors of approximately 20-40 m width with surrounding vegetation left intact. The Landscape Fragmentation and Connectivity (LFC) Tool has determined the impacts on connectivity areas within the Study area to be significant based on Arrow's GTRE mapping (total area of RVM Cat B clearing is 178.3 ha), but not significant using DETSI RE mapping. Impact values generated by the LFC Tool have been included in the PEMs table (refer **Table 5.4**). The outputs from the LFC Tool analysis are attached in **Appendix F**.

Loss of connectivity at the patch scale largely depends on the species under consideration; impacts associated with linear infrastructure corridors and waterway crossings are considered in further detail for individual threatened species (refer **Section 4.5**).

4.2.3 Impacts to hollow-bearing trees

The Glossy Black-cockatoo is a species assessed as known to occur in the Study area which can be described as hollow-dependant species.

The project layout and footprint has been designed to minimise impact to vegetation where possible and there is particular emphasis on minimising impacts to riparian vegetation through RoW minimisation and by locating any temporary workspaces outside of these areas.

The importance of riparian vegetation along the major creek systems in the Study area is discussed in **Section 3.3.2** and do represent habitats that are often less impacted by historical clearing and are more likely to contain large trees due to their position in the landscape. A discussion of the waterway crossing methodologies is presented in **Section 4.1.2**.

Large trees / trees with potential hollows are captured on the EFS survey sheets with counts of trees with hollows >10 cm, trees with hollows >30 cm and trees with hollows >50 cm. This data allows the identification of Glossy Black-cockatoo habitat which requires large hollows suitable for nesting.

Based on the EFS data (**Appendix E**) a significant proportion of the Study area does not contain large trees that contain hollows.

During construction hollow bearing trees, beyond the essential clearing footprint, identified from ecological survey data are flagged for retention and exclusion zones established to avoid potential impacts. Where required, clearing of hollows will be undertaken in accordance with the Arrow Energy Species Management Program (SMP) (Doc. No. ORG-ARW-HSM-PLA-00070) which authorises activities if it will impact on breeding places of protected animals, which includes relocation of hollows if breeding fauna are observed.

4.2.4 Indirect impacts

Indirect impacts on ecological values that may arise as a result of the Study area development include:

- edge effects resulting from the creation of smaller patches of vegetation with a greater edge to surface ratio, including increased exposure to weed invasion, light and wind penetration (which can alter microclimate features) potentially resulting in changes in community structure and composition over time;
- dust generation during construction, which has the potential to smother plants, reducing photosynthesis and resulting in decreased vegetation health and condition;
- increased noise from the vegetation clearing operations, the operation of machinery and vehicle traffic which may affect the behaviour of wildlife (typically limited to the construction period);
- increased lighting during construction and operation, with the potential to disrupt the behaviour of nocturnal species; and
- mortality resulting from vehicle collision.

Indirect impacts on the ecological values of the Study area will be managed in accordance with Arrow's existing Environmental Management Framework.

4.3 Impacts on State Forests

The southern portion of the Study area includes Kumbarilla State Forest. Construction in the southern portion of the Study area will involve the disturbance of approximately 137.3 ha within Kumbarilla State Forest. Remnant vegetation comprises approximately 80% of this disturbance, with the remaining 20% of disturbance to occur in cleared and regrowth vegetation.

4.4 Impacts on terrestrial flora values

4.4.1 Impacts on habitat for endangered flora species

4.4.1.1 Kogan Waxflower (*Philotheca sporadica*)

There are a total of three locations where Kogan Waxflower have been identified within the Project footprint. In accordance with the NC Act, protected plant surveys and a clearing permit application (or exempt clearing notification) with an impact management plan to avoid and minimise impact on threatened plants community will be developed and submitted undertaken prior to clearing. Impacts to Kogan Waxflower are also managed and offset under the EPBC Act approvals for the Project (refer to **Section 1.4.1**).

Construction of the Project will result in the direct loss of Kogan Waxflower at three locations and 1.9 ha of protected wildlife habitat containing Kogan Waxflower within a high risk area on the flora survey trigger map. Impacts to Kogan Waxflower will be managed in accordance with the protected plant clearing permit under the *Nature Conservation Act 1992*.

Due to these impacts being managed under both the NC Act and the EPBC Act there is considered to be no net loss of Kogan Waxflower and any offsets required under the State EO Act is a duplication of conservation requirements. Resultantly, there is no SRI that requires to be offset under the EO Act. The impact areas of Kogan Waxflower have been added into the PEMs table (**Table 5.5**) for completeness, but are noted to not be an SRI.

4.4.2 Endangered REs by VM Class

There will be 0.3 ha of endangered RE 11.3.1 impacted by the Project (as shown in **Figure 4.1**) out of 7.9 ha of endangered RE 11.3.1 that occurs within the Study area. Impacts to this RE were minimised as much as possible but alternative alignments were significantly limited due to sections of steep terrain and in some cases moving the alignment even slightly, results in an un-constructable design.

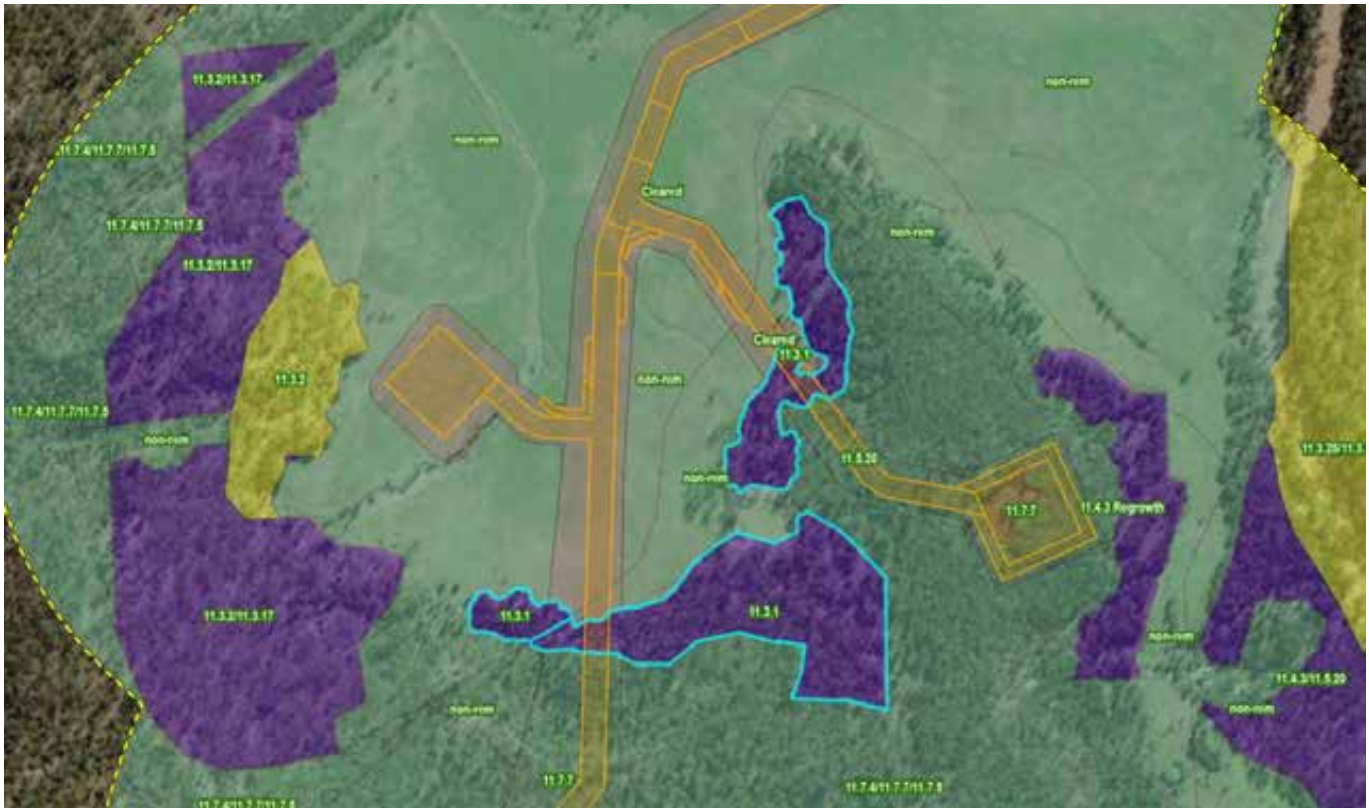

Figure 4.1 Location of endangered RE 11.3.1 impacted by the Project

4.4.3 Of concern REs by VM Class

Within the Study area, 'of concern' REs are restricted to alluvial systems, typically occurring as linear remnants or small patches along waterways and drainage features.

No 'of concern' REs will be impacted by the Project.

4.4.4 Impacts on watercourse vegetation

The Project will result in disturbance to approximately 1.6 ha of regulated vegetation within a defined distance from the defining banks of watercourses. These proposed impacts on are within the existing approved limits specified in the EA (refer **Table 5.4**.).

As per the distances set out in *Code 16: Native vegetation clearing of the State Development Assessment Provisions*, the following buffer distances have been defined to determine impacts on regulated vegetation within a defined distance from the defining banks of watercourses associated with the Project:

- stream order 1 or 2 – 10 m
- stream order 3 or 4 – 25 m
- stream order 5 or greater – 50 m

In the absence of Project-specific data defining the actual spatial location of defining banks, the watercourse centre line has been used to calculate the GTRE mapped vegetation within the defined distance relevant to the watercourse.

Impacts on watercourse vegetation associated with the Project are identified in **Table 5.4**. The majority of this vegetation is associated with minor waterways (stream order 1 or 2). The majority of these creek crossings are of minor waterways, which will be trenched outside the wet season in accordance with Arrow's standard crossing methodologies.

4.5 Impacts on terrestrial fauna values

The Project will have an impact on protected wildlife habitat for the species known or considered likely to occur in the Study area listed in **Table 4.2**. The Project will also impact on habitat for the Golden-tailed Gecko however, habitat for a near threatened species does not constitute a PEM under the EO Act and there is no requirement to offset this impact. Instead, impacts on habitat for Golden-tailed Gecko will be limited by restrictions imposed under the EA on petroleum pipeline activities in ESAs. As such, impacts on habitat for Golden-tailed Gecko have been excluded from **Table 4.2**.

Table 4.2 Summary of Project impacts on protected wildlife habitat

Species	Area of impact (ha)
Habitat for animals listed as endangered wildlife under the NC Act	
Koala, *Phascolarctos cinereus*	222.8
Grey Snake, *Hemiaspis damelii*	1.0
Habitat for animals listed as vulnerable wildlife under the NC Act	
Glossy Black-cockatoo (south-eastern), *Calyptorhynchus lathami lathami*	76.6
Painted Honeyeater, *Grantiella picta*	0.4
Diamond Firetail, *Stagonopleura guttata*	175.8
White-throated Needletail, *Hirundapus caudacutus*	0
Brigalow Woodland Snail, *Adclarkia cameroni*	1.0

Species	Area of impact (ha)
Pale Imperial Hairstreak, *Jalmenus eubulus*	0.3
Habitat for animals listed as special least concern wildlife under the NC Act	
Tachyglossus aculeatus, Echidna	0

SRI Assessments have been undertaken in accordance with the SRI Guidelines (DEHP, 2014) for endangered, vulnerable and special least concern fauna species and are documented in the sections below. The SRI Guidelines provide an explanation of some key terms used in these impact assessments, which have been summarised below:

- **Habitat**: is the area occupied, or periodically or occasionally occupied, by any species, population or ecological community and includes all the different aspects (both biotic and abiotic) used by the species during the different stages of their life cycles.
- **Long-term decrease**: Any decline in a local population that is greater than which could be apparent without the action being present.
- **Population**: Defined as an occurrence of the species in a particular area. In relation to endangered, vulnerable and special least concern species, occurrences include but are not limited to:
  - A geographically distinct regional population, or collection of local populations; or
  - A population, or collection of local populations, that occurs within a particular bioregion.

4.5.1 Impacts on habitat for endangered fauna species

4.5.1.1 Koala, *Phascolarctos cinereus*

Development of the SGP South will result in the direct loss of approximately 222.8 ha of potentially suitable habitat for Koala and would be expected to result in the loss of food trees wherever clearing occurs. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the Koala has been provided in **Table 4.3**. Suitable habitat mapping for this species can be found in **Figure 3.7a**.

Table 4.3 Significant Residual Impact Assessment for the Endangered Koala

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Likely** The species is common in the surrounding landscape and has been recorded within the southern portion of the Study area (ALA, 2019) in a patch of RE 11.7.4. The presence of Koala records in the region surrounding the Study area suggests that there is sufficient suitable habitat to support a local population of this species. Population numbers are likely to be sparse given the nature of the available habitat in the Brigalow Belt (DAWE, 2022a). Koalas are reported to utilise more than 400 different species of tree for their food and habitat requirements (DAWE, 2022a) resulting in all vegetated areas within the Study area being mapped as potential habitat for this species. Clearing for establishment of

SRI Criteria	Project Response
	the Project represents the direct loss of 561.9 ha of this habitat containing known browse species for Koala. The nature of coal seam gas infrastructure (which typically comprises clearing for well pads of 1-2 ha in size, and up to 30 m wide for linear infrastructure) means this clearing will not be concentrated in a single location, rather it will be dispersed over a large area. Despite this, impacts associated with the Project do have the potential to lead to a long-term decrease in the size of the local Koala population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon excluding cases of vagrancy (IUCN, 2024). The estimated extent of occurrence for the Koala is approximately 1,665,850 km^2 (DAWE, 2022a). Whilst the Project will require the removal of approximately 222.8 ha of suitable habitat for this species, this impact only represents 3.4% of the total habitat available to this species within the broader Study area. Considering that the Project is situated well within the known distribution of the Koala and this region is already experiencing localised habitat fragmentation, it is considered unlikely that the construction and ongoing operation of the Project will reduce the extent of occurrence for this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** Whilst Koalas are known to be sensitive to habitat loss resulting from land clearing (DAWE, 2022a) they are capable of dispersing between areas of suitable habitat and persisting in highly fragmented habitats for long periods of time (Youngentob, Marsh, & Skewes, 2021). In addition to regular movements across the ground between trees within their own home ranges, Koalas, particularly subadult males but also females, are known to disperse across distances of 1 to 3 km but sometimes over 10 km (Youngentob, Marsh, & Skewes, 2021). Whilst the construction of the Project will lead to some fine scale habitat fragmentation, it is considered unlikely that these impacts will effectively fragment an existing population.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** Conservation Advice for the Koala (DAWE, 2022a) has identified four spatially distinct, genetic koala management units, including: • QLD and NSW populations north of the Clarence River Valley, NSW; • South of the Clarence River Valley, NSW to north of the Sydney Basin; • South of the Sydney Basin to approximately the NSW/VIC boarder; and • VIC and SA populations Given the Projects location within the QLD and NSW Koala management unit, any localised habitat fragmentation is unlikely to result in a genetically distinct subpopulation from forming. There is also a broad recognition of the Koala's dispersal capabilities across cleared land (Youngentob, Marsh, & Skewes, 2021). It is therefore considered unlikely that the construction of the Project will result in genetically distinct populations from forming from habitat isolation.

SRI Criteria	Project Response
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Predation by Feral Dogs (Canis sp.) is listed as a key threatening process for the Koala (DAWE, 2022a). It is considered unlikely that the construction and ongoing operation of the Project will result in these species becoming established in the area or exacerbate an existing occurrence of these pest species. To help manage pest species across the Project, Arrow have developed a PMP for the broader SGP. This PMP will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project footprint. It is therefore considered unlikely that the Project will result in invasive species being established.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** Koala retrovirus and Chlamydia (*Chlamydia percorum*) are known to be prevalent amongst Koala populations in northern Australia (DAWE, 2022a). It is currently unknown whether these diseases are present within the local population of Koalas that have been identified in the vicinity of the Project, but it is considered unlikely that the construction and ongoing operation of the Project will introduce these diseases to local populations or exacerbate any pre-existing diseases that may already be present.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Likely** Considering the high-profile nature of the Koala there is an abundance of conservation advice and recovery objectives documented for this species. Both *the National Recovery Plan for the Koala* (DAWE, 2022a) and the *South-East Queensland Koala Conservation Strategy 2020-2025* (DES, 2020) lists increasing habitat protection and habitat restoration as priority conservation and recovery objectives. Considering that the construction of the Project will require the removal of 222.8 ha of potentially suitable habitat for the Koala, it is likely that this action could interfere with the recovery of the species.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Likely** Koalas are reported to utilise more than 400 different species of tree for their food and habitat requirements (DAWE, 2022a) resulting in all vegetated areas within the Study area being mapped as potential habitat for this species. Breeding, feeding and resting sites for Koalas are not location-specific and will be dispersed across habitat throughout the Study area, though there is some evidence that Koalas have a preference for individual trees in any given area of habitat (DAWE, 2022a). Development of the Project will result int eh removal of 561.9 ha of potentially suitable habitat for the Koala, and it is likely that the Project will disrupt ecologically significant locations for this species.
It is considered **likely** that the Project will have a significant residual impact on the Koala.	

4.5.1.2 Grey Snake, *Hemiaspis damelii*

Construction of the Project will result in the direct loss of 1.0 ha of potentially suitable habitat for the Grey Snake. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the Grey Snake has been provided in **Table 4.4**. Suitable habitat mapping for this species can be found in **Figure 3.12**.

Table 4.4 Significant Residual Impact Assessment for the Endangered Grey Snake

SRI CRITERIA	PROJECT RESPONSE
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a population?	**Unlikely** The presence of Grey Snake records in the region surrounding the Study area suggests that there is sufficient suitable habitat to support a local population of this species. The construction of the Project will result in the direct loss of 1.0 ha of potentially suitable habitat for the Grey Snake, however when compared to the abundance of suitable habitat within the Study area (217.4 ha), this impact only represents a loss of approximately 1.1% of the available habitat. Several areas containing abundant microhabitat features, in the form of soil cracks (DCCEEW, 2022c), have been identified and confirmed within the northern and southern portions of the Study area. These areas align with Land Zone 3 and 4 vegetation communities which are more likely to support gilgai microhabitat features for this species, or are more likely to be inundated during rainfall events, suggesting that local populations are likely to be seasonally present within these areas. Despite the occurrence of suitable habitat for this species and the proximity of recent records, the scale of the proposed impact in relation to the surrounding available habitat suggests, that its unlikely that the Project will lead to a long-term decrease in the size of a local population of this species.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon excluding cases of vagrancy (IUCN, 2024). The estimated extent of occurrence for the Grey Snake is approximately 471,500 km^2 (DCCEEW, 2022c). Whilst the Project will require the removal of approximately 1.0 ha of suitable habitat for this species, this impact only represents 1.1% of the total habitat available to this species within the broader Study area. Considering that the Project is situated well within the known distribution of the Grey Snake and this region is already experiencing localised habitat fragmentation, it is considered unlikely that the construction and ongoing operation of the Project will reduce the extent of occurrence for this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** The overall Grey Snake population is considered severely fragmented due to specific ecological constraints. Moreover, intra-population fragmentation is caused by agricultural practices removing suitable habitat (DCCEEW, 2022c). There is currently no information available about home range and dispersal ability of the Grey Snake. however, based on the information available from other Australian elapids, it is inferred that the Grey Snake is likely to have little capacity to move between isolated populations (DCCEEW, 2022c). During the design stages of this Project, Arrow has also attempted to co-locate this pipeline with existing linear infrastructure to further reduce the effects of habitat

SRI CRITERIA	PROJECT RESPONSE
	fragmentation. Localised fragmentation may occur during construction activities, however once these areas have been constructed and rehabilitated, these areas are unlikely to represent ongoing physically barriers to the movement of local Grey Snake populations. It is therefore considered unlikely that the Project will fragment an existing population.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** Although it is believed that there is very little gene flow among isolated and fragmented populations (DCCEEW, 2022c), localised intra-population dispersal may still occur. Project infrastructure is unlikely to physically inhibit the dispersal of locally fragmented populations. Given the Project's location within the QLD and NSW Grey Snake distribution, any localised habitat fragmentation is unlikely to result in a genetically distinct population from forming.
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Predation by Feral Cats (*Felis catus*) and European Red Foxes (*Vulpes vulpes*), and habitat destruction by Feral Pigs (*Sus scrofa*) are listed as potential threatening processes for the Grey Snake (DCCEEW, 2022c). It is considered unlikely that the construction and ongoing operation of the Project will result in these species' becoming established in the area or exacerbate an existing occurrence of these pest species. To help manage pest species across the Project, Arrow have developed a PMP for the broader SGP. This PMP will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project footprint. It is therefore considered unlikely that the Project will result in invasive species being established.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** There are no known diseases listed as threatening processes for the Grey Snake. It is therefore considered unlikely that the construction and ongoing operation of the Project will introduce any diseases that could cause the population to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Likely** The conservation advice for the Grey Snake (DCCEEW, 2022c), lists protecting habitat from destruction and controlling invasive species as priority conservation and recovery objectives. Considering that the construction of the Project will require the removal of 1.0 ha of suitable habitat for the Grey Snake, it is therefore considered likely that this action could interfere with the recovery of the species.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Likely** Considering that the occurrence of Grey Snakes is limited to specific microhabitats (i.e. cracking soils near alluvial systems), it is reasonable to assume that any suitable habitat mapped for this species could be utilised for breeding and/or foraging activities. Given that the Project will require impacts to 1.0 ha of suitable habitat for this species, it is likely that these impacts will disrupt ecologically significant location(s) for the Grey Snake.

SRI CRITERIA	PROJECT RESPONSE
It is considered **likely** that the Project will have a significant residual impact on the Grey Snake.	

4.5.2 Impacts on habitat for vulnerable fauna species

4.5.2.1 Glossy Black-cockatoo (south-eastern), *Calyptorhynchus lathami lathami*

Development of the SGP South will result in the direct loss of 76.6 ha of clearing within habitat containing potential shelter and foraging resources for the Glossy Black-cockatoo. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the Glossy Black-cockatoo has been provided in **Table 4.5**. Suitable habitat mapping for this species can be found in **Figure 3.9.**

Table 4.5 Significant Residual Impact Assessment for the Vulnerable Glossy Black-cockatoo

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Unlikely** Several Glossy Black-cockatoos have been recorded within the southern portion of the Study area during consolidated survey efforts. This species appears to be abundant throughout Kumbarilla State Forest and up to Lake Broadwater. In contrast, no records have been recorded within the northern portion of the Study area, with the nearest records being located around Kogan. Glossy Black-cockatoos are highly dispersive and any individuals using the Study area are likely to occupy a far greater range. It is therefore unlikely that any population would rely heavily on the Study area for the entirety of its resource needs. Whilst the Project will require the removal of approximately 76.6 ha of potentially suitable habitat, this only represents 2.3% of the total habitat available for this species within the Study area. As such, the loss of this habitat is unlikely to lead to a long-term decrease in the size of a local population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon excluding cases of vagrancy (IUCN, 2024). The estimated extent of occurrence for the Koala is approximately 470,000 km^2 (DCCEEW, 2022d). Whilst the Project will require the removal of approximately 76.6 ha of suitable habitat for the Glossy Black-cockatoo they are highly dispersive and any individuals using the Study area are likely to occupy a far greater range. It is unlikely that any population would rely heavily on suitable habitat within the Project footprint for the entirety of its resource needs. Project impacts are therefore unlikely to reduce the extent of occurrence for this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** While the Glossy Black-cockatoo is susceptible to habitat fragmentation (DCCEEW, 2022d), being highly mobile, this species may travel considerable distances to isolated fragments in search of food. Given the highly vegetated nature of the surrounding area

SRI Criteria	Project Response
	and adjoining State Forests, it is unlikely that the loss of 76.6 ha of potential habitat would result in a significant impact on connectivity for this species. Thus, impacts to suitable habitat are unlikely to create a barrier to movement for the species to fragment an existing population of Glossy Black-cockatoo.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** Glossy Black-cockatoo (south-eastern) is one of three recognised subspecies (along with the Kangaroo Island and northern subspecies). Within the south-eastern subspecies, though there was previously thought to be a separate Riverina population in western NSW, the subspecies is now considered to be a single main population (DCCEEW, 2022d). The high mobility of this bird species suggests that fragmentation as a result of the Project is unlikely to provide a significant barrier to species movement. Thus, impacts to suitable habitat are unlikely to create a barrier to movement for the species to result in genetically distinct populations of Glossy Black-cockatoo forming.
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Locally, fragmentation and the removal of hollow-bearing trees may increase predation of nestlings or alternatively result in higher competition for hollows by 'edge' species such as the Common Brushtail Possum (DCCEEW, 2022d). However, the Project is not expected to introduce new invasive species to the Study area. Invasive weeds are a threat to Glossy Black-cockatoo due to their increased bushfire risk (DCCEEW, 2022d). The Project is expected to provide improvement to bushfire risk in the Study area through the inclusion of a bushfire mitigation strategies. Thus, impacts to suitable habitat are considered unlikely to result in invasive species harmful to Glossy Black-cockatoo becoming established in Glossy Black-cockatoo habitat.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** Psittacine Beak and Feather Disease (PBFD) is a potentially fatal disease caused by psittacine circovirus, typically transferred between adults, nestlings and contaminated nest hollows. Although south-eastern Glossy Black-cockatoos are susceptible to PBFD, the threat level is relatively low compared to other threats (DCCEEW, 2022d). While the loss of nest hollows can lead to greater competition, and thus an increased likelihood of transmission, the loss of 76.6 ha of potentially suitable habitat compared to the available habitat remaining within the Study area (only a reduction of 2.3%), is unlikely to result in a significant loss of hollows, or to impinge on connectivity with surrounding habitat and hollows. Thus, impacts to suitable habitat are unlikely to introduce disease that may cause the population to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Unlikely** The Conservation Advice for Glossy Black-cockatoo (DCCEEW, 2022d) lists protecting, restoring and enhancing the quality of known suitable habitat, maintaining connectivity, increasing hollow availability and appropriate fire regimes as priority conservation and recovery objectives. The implementation of bushfire mitigation strategies across the Project will be undertaken in accordance with those already established for the broader SGP. These have been designed to account for both buried infrastructure and exposed

SRI Criteria	Project Response
	vents/drains so that during the construction and operational phases of the Project, bushfire risks are mitigated. Despite this however, the development of the Project will require the removal of 76.6 ha of potentially suitable habitat for Glossy Black Cockatoo, which may interfere with the recovery of this species.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Likely** The Glossy Black-cockatoo rely on nine species of she-oaks (*Allocasuarina spp*. and *Casuarina spp*.) for feeding. In south-east Queensland, they show preference for Black Sheoak (*A. littoralis*) and Forest Sheoak (*A. torulosa*). They prefer Narrow-leaved Ironbark (*Eucalyptus crebra*) for nesting hollows (DCCEEW, 2022d). Impacted areas represent a potential foraging resource and the removal of hollow-bearing trees could result in the loss of nesting sites within the Study area. Considering that the construction of the Project will require the removal of 76.6 ha of potentially suitable habitat for the Glossy Black-cockatoo, it is likely that the Project will disrupt ecologically significant locations for this species.
It is considered **likely** that the Project will have a significant residual impact on the Glossy Black-cockatoo.	

4.5.2.2 Painted Honeyeater, *Grantiella pica*

It has been determined that the construction of the Project will result in the direct loss of 0.4 ha of potentially suitable habitat for the Painted Honeyeater. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the Painted Honeyeater has been provided in **Table 4.6**. Suitable habitat mapping for this species can be found in **Figure 3.9**.

Table 4.6 Significant Residual Impact Assessment for the Vulnerable Painted Honeyeater

SRI CRITERIA	PROJECT RESPONSE
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Unlikely** Whilst no Painted Honeyeaters have been recorded within the Study area, several nearby historical records have been identified suggesting that local populations may periodically utilise available habitat. The closest records to the Study area are situated around Lake Broadwater (approximately 7 km to the north (ALA, 2016)). Whilst the construction of the Project will require the removal of 0.4 ha of suitable habitat for the Painted Honeyeater, the highly mobile nature of this species, and the relatively small proportion of suitable habitat that will be impacted by the Project (1.9%) indicates that the construction and ongoing operation of the Project is unlikely to be detrimental to any locally occurring populations. It is therefore considered unlikely that impacts to suitable habitat will lead to a long-term decrease in the size of an existing population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon excluding cases of

SRI CRITERIA	PROJECT RESPONSE
	vagrancy (IUCN, 2024). The estimated extent of occurrence for the Painted Honeyeater is approximately 2,800,000 km^2 (DOE, 2015b). Whilst the Project will require the removal of approximately 0.4 ha of suitable habitat for the Painted Honeyeater they are highly dispersive and any individuals using the Study area are likely to occupy a far greater range. It is unlikely that any population would rely heavily on suitable habitat within the Project footprint for the entirety of its resource needs. Project impacts are therefore unlikely to reduce the extent of occurrence for this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** The landscape within the Study area is already highly fragmented from years of pastoral and agricultural land use however, large areas of continuous non-remnant vegetation still exist. Whilst the Project will require the removal of 0.4 ha of suitable Brigalow habitat for the Painted Honeyeater, this impact only represents a small portion (1.9%) of the available habitat for this species within the broader Study area (20.5 ha). During the design stages of this Project, Arrow has also attempted to collocate this pipeline with existing linear infrastructure to reduce the effects of habitat fragmentation. Considering the highly mobile nature of this species and the extent of the proposed impacts, it is considered unlikely that the construction and ongoing operation of the Project will contribute to the fragmentation of an existing population.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	Painted Honeyeaters are nomadic and migratory, moving latitudinally from foraging areas in Western Australia and Northern Territory to breeding locations in New South Wales (Menkhorst, et al., 2022), with most records identified within the Study area occurring from September to November. Additionally, many of the observations of this species occur in non-remnant regrowth, implying that Painted Honeyeaters are tolerant to habitat disturbance and are reliant on food availability over habitat structure. Considering the migratory nature of this species along with their apparent tolerance to disturbed habitat, it is unlikely that impacts to suitable habitat for this species will result in genetically distinct populations forming.
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** The decline in the productivity of suitable habitats through grazing by European Rabbits (*Oryctolagus cuniculus*) is listed as a key threatening process for the Painted Honeyeater (DOE, 2015b). The presence of rabbits has already been confirmed from the broader SGP Project area. No other invasive species are listed in the conservation advice for this species. To help manage pest species across the Project, Arrow have developed a PMP for the broader SGP. This PMP will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project footprint, and to ensure that existing pest species are not exacerbated by this construction. It is therefore considered unlikely that the Project will result in any new invasive species being established.
Are impacts to suitable habitat likely to introduce disease that	**Unlikely** There are currently no diseases listed as threatening processes for the Painted Honeyeater. It is considered unlikely that the construction and ongoing operation of the Project will introduce any such diseases to the Study area.

SRI CRITERIA	PROJECT RESPONSE
may cause the population to decline?	
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Likely** According to the conservation advice (DOE, 2015b) there are three primary conservation objectives for the Painted Honeyeater, including maintaining stable populations at key sites, ensuring no further clearance of suitable habitat, and maintaining adequate numbers of mature trees and mistletoe populations across its distribution. Despite the highly mobile nature of this species and fact that the construction of the Project will require the removal of 0.4 ha of suitable habitat suggests that the Project is likely interfere with the recovery of this species. Considering the scale of this impact in relation to the available habitat in the surrounding Study area (only 1.9%) however, this impact is not considered to be significant.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Likely** Given that Painted Honeyeaters are nomadic migrants, the most important habitat amenity to this species is food availability. Feeding habitat for the Painted Honeyeater has been defined as woodland habitats with a sufficient abundance of mistletoe, the fruits of which are a major dietary component for Painted Honeyeaters (Menkhorst, et al., 2022). Therefore, presence of mistletoe host plants (mainly *Casuarina sp.* and *Acacia sp.*) would be a significant driver of presence, although not critical. Although the construction of the Project will require the removal of 0.4 ha of suitable habitat for this species, which is likely to disrupt ecologically significant locations, the scale of this impact is not considered to be significant.
It is considered **likely** that the Project will have a significant residual impact on the Painted Honeyeater.	

4.5.2.3 Diamond Firetail, *Stagonopleura guttata*

Development of the SGP South will result in the direct loss of 175.8 ha of clearing within habitat containing potential shelter and foraging resources for the Diamond Firetail. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the Diamond Firetail has been provided in **Table 4.7**. Suitable habitat mapping for this species can be found in **Figure 3.9**.

Table 4.7 Significant Residual Impact Assessment for the Vulnerable Diamond Firetail

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Unlikely** There are scattered (undated) historical records of the Diamond Firetail across the broader SGP Project, however despite extensive survey efforts this species has not been detected within the Study area. The nearest reliable record was identified approximately 3 km to the northeast (ALA, 2012). If a population is present, it is likely to be relatively low density, and at an abundance of suitable habitat will remain unaffected. Whilst the construction of the Project will require the removal of approximately 175.8 ha of suitable habitat for this species, this only represents 2.7% of the total available habitat mapped for this species within the Study area. It is therefore unlikely that the

SRI Criteria	Project Response
	development of the Project will lead to a long-term decrease in the size of a local population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon excluding cases of vagrancy (IUCN, 2024). The estimated extent of occurrence for the Koala is approximately 1,500,000 km^2 (DCCEEW, 2023). Considering their highly mobile nature and given that the Project is located well within the known distribution of the Diamond Firetail, it is considered unlikely that the Project will reduce the extent of occurrence of this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** While the Diamond Firetail is susceptible to habitat fragmentation and appears to be sedentary (DCCEEW, 2023), populations are known to move locally and, as birds, are capable of flight in long lines between shrubs and to/from the ground for feeding. Given the highly vegetated nature of the surrounding area and adjoining State Forests, it is unlikely that the loss of 175.8 ha of potential habitat would result in a significant impact on connectivity for this species. Thus, impacts to suitable habitat are unlikely to create a barrier to movement for the species to fragment an existing population of Diamond Firetail.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** Whilst extensive genetic studies have not yet been undertaken for this species, all individuals are believed to be part of a single genetic population. Diamond Firetail groups typically separate into small breeding colonies between August and January and build their nests into the base of birds-of-prey nests or the prickly foliage of shrubs (DCCEEW, 2023). The potential habitat loss of 175.8 ha is unlikely to restrict the movement of a population or restrict access to nesting resources to the extent that genetically distinct populations would form.
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Listed threats for Diamond Firetail include exotic annual grasses (e.g. African Lovegrass *Eragrostis curvula*) as a major threat, increased territorial competition by Noisy Miners (*Manorina melanocephala*) as a moderate threat and, predation by Pied Currawong (*Strepera graculina*) and habitat degradation by Rabbits (*Oryctolagus cuniculus*) as minor threats (DCCEEW, 2023). Noisy Miners usually benefit from landscape scale clearing and fragmentation of open woodland vegetation with limited shrubby understory (DCCEEW, 2023). Pied Currawongs are also considered edge-specialist predators that benefit from increased fragmentation and edge effects in Diamond Firetail habitat. However, neither species is considered likely to gain competitive advantage or increase predation as a result of Project development. The presence of rabbits has already been confirmed from the broader SGP Project area. To help manage pest species across the Project, Arrow have developed a PMP for the broader SGP. This PMP will help to ensure that appropriate management strategies are

SRI Criteria	Project Response
	implemented to control pest species that could occur within the Project footprint, and to ensure that existing pest species are not exacerbated by this construction. It is therefore considered unlikely that the Project will result in any new invasive species being established.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** Conservation Advice does not list any diseases amongst the threats for Diamond Firetail (DCCEEW, 2023). Thus, impacts to suitable habitat are unlikely to introduce disease that may cause the population to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Possible** The Conservation Advice for Diamond Firetail (DCCEEW, 2023) lists retaining and protecting suitable habitat from clearing, fragmentation and disturbance, reducing grazing intensity and removing weed species as priority conservation and recovery objectives. Despite the highly mobile nature of this species and fact that the construction of the Project will require the removal of 175.8 ha of suitable habitat suggests that the Project is likely interfere with the recovery of this species. Considering the scale of this impact in relation to the available habitat in the surrounding Study area (only 2.7%) however, this impact is not considered to be significant.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Possible** Diamond Firetails occur in eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats, including farmland and grasslands with scattered trees (DCCEEW, 2023). They tend to prefer areas with relatively low tree densities where they forage at ground level, on grass and herb seeds, green leaves and insects. Impacted areas represent potential foraging and nesting habitat. Although the construction of the Project will require the removal of 175.8 ha of suitable habitat for this species, which is likely to disrupt ecologically significant locations, the scale of this impact is not considered to be significant.
It is considered **Possible** that the Project will have a significant residual impact on the Diamond Firetail.	

4.5.2.4 White-throated Needletail, *Hirundapus caudacutus*

To determine whether the Project will have a significant residual impact on this species, an assessment of potential impacts against the Significant Residual Impact Guidelines (DEHP, 2014) for this vulnerable species has been undertaken, the results of which are provided in **Table 4.8**.

Table 4.8 Assessment of significant residual impacts for the Vulnerable white-throated needletail

SRI CRITERIA	PROJECT RESPONSE
Is the action likely to lead to a long-term decrease in the size of a local population?	**Unlikely** The occurrence of historical records within and adjacent to the Study area indicates that the broader SGP Project is utilised by a portion of the global population of White-throated Needletails during their non-breeding season. Whilst development of

SRI CRITERIA	PROJECT RESPONSE
	the Project will require the removal vegetation within the Project footprint, these terrestrial impacts are unlikely to affect the availability of aerial foraging habitat for this species. The white-throated needletail has a preference for dense roosting habitat (TSSC, 2019b). The structural category of REs as listed in the Regional Ecosystem Description Database (REDD) provides a useful proxy, with 'dense' REs indicating potential roosting habitat. A review of the ground-truthed REs within the Project footprint indicated that there is unlikely to be any suitable roosting habitat for this species. It is therefore considered unlikely that development of the Project will lead to a long-term decrease in the size of a local population.
Is the action likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon excluding cases of vagrancy (IUCN, 2024). The extent of occurrence for the White-throated Needle encompasses the entirety of Australia which is approximately 7.7 million km^2 (TSSC, 2019; ALA, 2024). Whilst the construction and ongoing operation of the Project will require the removal of vegetation within the Project footprint, these terrestrial impacts are unlikely to affect the availability of aerial foraging habitat for this species. Additionally, no suitable roosting habitat has been identified within the Study area. It is therefore considered unlikely that the Projects' terrestrial impacts will reduce the extent of occurrence for this species.
Is the action likely to fragment an existing population?	**Unlikely** The landscape within the Study area is already partly fragmented from years of pastoral and industrial activities. Based on available aerial imagery, this fragmentation dates back to at least 1958 (QI, 2024). Considering the aerial nature of this species, terrestrial fragmentation is unlikely to affect the dispersal capabilities of this species as they move through the surrounding landscape. Whilst the construction and ongoing operation of the Project will contribute to the general terrestrial fragmentation of the surrounding landscape, no suitable roosting habitat for this species has been observed within the Study area. It is therefore considered unlikely that the construction and ongoing operation of the Project will fragment an existing population of White-throated Needletails.
Is the action likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** There are currently two recognised subspecies of White-throated Needletail (*H.c. nudipes* and *H.c. caudacutus*) (TSSC, 2019). *H.c caudactus* is the only subspecies known to overwinter in Australia. Whilst extensive genetic studies have not yet been conducted on this species, it is believed that all individuals found in Australia belong to a single genetic population. Furthermore, no suitable roosting habitat for this species has been mapped within the Study area and terrestrial fragmentation resulting from the Project is unlikely to isolate any locally occurring populations. It is therefore considered unlikely that the construction and ongoing operation of the Project will result in genetically distinct populations forming.
Is the action likely to result in invasive species	**Unlikely**

SRI CRITERIA	PROJECT RESPONSE
that are harmful to the endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	Whilst numerous invasive flora and fauna species have been observed across the broader SGP Project, there are currently no invasive species listed as threatening processes for the White-throated Needletail (TSSC, 2019). Regardless of this, to help manage pest species across the Project, Arrow have developed an overarching pest management strategy and Pest Management Plan (PMP) for the broader SGP. This PMP will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project footprint, including the Black Rat. It is therefore considered unlikely that the construction and ongoing operation of the Project will result in any invasive species becoming established.
Is the action likely to introduce disease that may cause the population to decline?	**Unlikely** The conservation advice does not list any diseases as threatening processes for the White-throated Needletail (TSSC, 2019). It is therefore considered unlikely that the construction and ongoing operation of the Project will introduce any diseases that could cause this species to decline.
Is the action likely to interfere with the recovery of the species?	**Unlikely** There are currently no recovery or management objectives listed for the White-throated Needletail in the conservation advice (TSSC, 2019) or the species profile (DoE, 2024a). Considering the aerial nature of this species, and the fact that they are a non-breeding migrant to Australia, it is conceivable that the protection of suitable roosting sites may become a recovery objective for this species. Given their aerial nature and ability to forage above most vegetated areas, it is unlikely that impacts to foraging habitat is likely to become a recovery objective for this species. No suitable roosting habitat for this species has been mapped within the Study area. Whilst the development of the Project will require the removal of terrestrial vegetation, these impacts are unlikely to impact the aerial foraging habitat above these communities. It is therefore considered unlikely that the construction and ongoing operation of the Project will interfere with the recovery of this species.
Is the action likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Unlikely** Considering the abundance of historical records both within and adjacent to the broader SGP Project, the Study area can be considered an ecologically significant location for the White-throated Needletail as it supports and abundance foraging opportunities for this species. Given their aerial nature, terrestrial impacts to vegetation communities are unlikely to affect the foraging opportunities for this species. Furthermore, no suitable roosting habitat has been identified within the Study area. It is therefore considered unlikely that impacts to support the construction and ongoing operation of the Project will disrupt an ecologically significant location for the White-throated Needletail.
It is therefore considered **unlikely** that the Project will have a significant residual impact on the White-throated Needletail.	

4.5.2.5 Brigalow Woodland Snail, *Adclarkia cameroni*

Development of the SGP South will result in the direct loss of 1.0 ha of potentially suitable habitat associated with the major creek systems through the central part of the Study area. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the Brigalow Woodland Snail has been provided in **Table 4.5**. Suitable habitat mapping for this species can be found in **Figure 3.10**.

Table 4.9 Significant Residual Impact Assessment for the Vulnerable Brigalow Woodland Snail

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a local population?	**Unlikely** Whilst no records of the Brigalow Woodland Snail have been recorded within the Study area, there are several records in the immediate vicinity, suggesting that a local population(s) could occur within the Study area. The construction of the Project will result in the removal of approximately 1.0 ha of suitable habitat for this species associated with the Condamine River in the northern portion of the Study area, and a patch of RE 11.5.1 in the southern portion of the Study area. Considering the limited mobility capacity of this species, and the fact that no individuals have been identified within the Study area, it is unlikely that the Project will lead to a long-term decrease in the size of a local population of this species.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon excluding cases of vagrancy (IUCN, 2024). The estimated extent of occurrence for the Brigalow Woodland Snail is approximately 27,924 km^2 (TSSC, 2016b). The Project will require the removal of 1.0 ha of suitable habitat for the Brigalow Woodland Snail this only represents only 1.4% of the suitable habitat identified in the Study area. Considering that the Project is situated in the middle of the known distribution of the Brigalow Woodland Snail and this region is already experiencing localised habitat fragmentation, it is considered unlikely that the construction and ongoing operation of the Project will reduce the extent of occurrence for this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** As this species is not highly mobile, it is assumed that known records represent isolated sub-populations of the Brigalow Woodland Snail, as it is very unlikely that there is movement between these populations. The loss of potentially suitable habitat is limited in extent, being confined to two areas; one along the Condamine River and the other within a patch of RE 11.5.1 associated with an unnamed tributary of Lake Broadwater. Whilst the construction of the Project will require the permanent removal of approximately 1.0 ha of overstory vegetation and suitable microhabitat features required by this species, the areas of potentially suitable habitat identified within the Study area will not be significantly fragmentated. Dispersal from any upstream populations would still be possible during higher rainfall events that could result in individuals being washed downstream.

SRI Criteria	Project Response
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** Population genetic studies are currently listed as one of the key research priorities for the Brigalow Woodland Snail suggesting that very little is known about the genetics of this species (TSSC, 2016b). For the purposes of this assessment, it has been assumed that each known record represents an isolated (potentially genetically distinct) sub-population of the Brigalow Woodland Snail, as it is very unlikely that there is movement between these records. The removal of approximately 1.0 ha of potentially suitable habitat Whilst the construction of the Project will require the permanent removal of approximately 1.0 ha of overstory vegetation and suitable microhabitat features required by this species, the areas of potentially suitable habitat identified within the Study area will not be significantly fragmentated. Dispersal from any upstream populations would still be possible during higher rainfall events that could result in individuals being washed downstream.
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** Several invasive species have been identified as conservation and management priorities for the Brigalow Woodland Snail, including: Buffel Grass (*Cenchrus ciliaris*), Feral Pigs (*Sus scrofa*) as well as introduced rat and mice species (TSSC, 2016b). There are no significant barriers to these species and all are likely to be already established within the Study area, with Buffel grass noted as a key component in the ground layer for RE 11.3.4 (EcoSmart, 2017). To minimise the spread of this species, and to help manage other invasive species listed under the *Biosecurity Act 2014*, Arrow have developed a Weed Management Plan (WMP) that has general vehicle hygiene requirements that will be followed during the construction and operational phases of the Project. Thus, impacts to suitable habitat are unlikely to result in invasive species that are harmful to Brigalow Woodland Snail becoming established in Brigalow Woodland Snail habitat.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** There are no known diseases listed as threatening processes for the Brigalow Woodland Snail. It is considered unlikely that the construction and ongoing operation of the Project will introduce any that could cause potential Brigalow Woodland Snail populations to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Likely** The Conservation Advice for the Brigalow Woodland Snail (TSSC, 2016b), lists preventing clearing of brigalow habitat and other habitat where the Brigalow Woodland Snail could occur, retaining a buffer of native vegetation and records of the species, and controlling Buffel Grass infestations as priority conservation and recovery objectives. Considering the cryptic nature of this species and the proximity of the nearest record (within 300m of the Study area), it is conceivable that local populations may occur within the Study area and were not detected during consolidated survey efforts. Given that the Project will require the removal of 1.0 ha of potentially suitable habitat for the

SRI Criteria	Project Response
	Brigalow Woodland Snail, it is likely that these impacts will interfere with the recovery of this species.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Possible** Whilst no Brigalow Woodland Snails have been observed within the Study area, the proximity of the nearest record (approximately 300m from the Study area) suggests that local populations may occur and were not detected during consolidated survey efforts. If local populations are identified during the construction of the Project, then it is likely that impacts to these areas will constitute a disruption to an ecologically significant location for this species.
It is considered **likely** that the Project will have a significant residual impact on the Brigalow Woodland Snail.	

4.5.2.6 Pale Imperial Hairstreak, *Jalmenus eubulus*

Construction of the Project will result in the direct loss of 0.3 ha of potentially suitable habitat for the Pale Imperial Hairstreak. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for the Pale Imperial Hairstreak has been provided in **Table 4.10**. Suitable habitat mapping for this species can be found in **Figure 3.10**.

Table 4.10 Significant Residual Impact Assessment for the Vulnerable Pale Imperial Hairstreak

SRI Criteria	Project Response
Are impacts to suitable habitat likely to lead to a long-term decrease in the size of a population?	**Unlikely** Whilst no Pale Imperial Hairstreak butterflies have been observed within the Study area, several historical records have been identified in the surrounding region, the closest of which are associated with Lake Broadwater and Kumbarilla State Forest. This species is restricted within its range to mature stands of the larval food plant (*Acacia harpophylla*). Whilst the construction of the Project will require the removal of 0.3 ha of suitable habitat for this species, the proportion of suitable habitat within the broader Study area that will be impacted by the Project (2.8%) is considerably small, therefore the construction and ongoing operation of the Project is unlikely to be detrimental to any locally occurring populations. It is therefore considered unlikely that impacts to suitable habitat will lead to a long-term decrease in the size of an existing population.
Are impacts to suitable habitat likely to reduce the extent of occurrence of the species?	**Unlikely** The extent of occurrence is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon excluding cases of vagrancy (IUCN, 2024). Whilst a formal assessment of this Pale Imperial Hairstreak's extent of occurrence hasn't been undertaken, the EOO tool embedded in the Atlas of Living Australia (ALA) indicates that the extent of occurrence for this species is approximately 216,570 km^2. The Project will require the removal of 0.3 ha of suitable habitat for the Pale Imperial Hairstreak this only represents only 2.8% of the suitable habitat identified in the Study area. Considering that the Project is situated within the known distribution of the Pale Imperial Hairstreak and this region is already experiencing localised habitat

SRI Criteria	Project Response
	fragmentation, it is considered unlikely that the construction and ongoing operation of the Project will reduce the extent of occurrence for this species.
Are impacts to suitable habitat likely to fragment an existing population?	**Unlikely** Whilst the Pale Imperial Hairstreak is not known to tolerate habitat disturbance and clearing (Braby, 2016), it is known to be present within the region surrounding the Study area despite the current extent of habitat fragmentation. It seems that the actual area of remnant vegetation required by the Pale Imperial Hairstreak is relatively small, provided that the habitat contains old-growth *A. harpophylla* elements. Whilst the Project will result in the direct loss of 0.3 ha of suitable habitat for this species, the Project ROW is unlikely to be a barrier to dispersal for the Pale Imperial Hairstreak. It is therefore considered unlikely that impacts to suitable habitat will fragment an existing population.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** Very little is known about the genetics of the Pale Imperial Hairstreak, however for the purposes of this assessment, it has been assumed that all known records belong to a single genetic population. Despite the high level of clearing that has occurred throughout much of the Brigalow Belt in Queensland, the larval food plant for this species (*Acacia harpophylla*) despite the currently level of fragmentation. Considering that adults of the Pale Imperial Hairstreak are capable of dispersing between areas of suitable habitat, it is unlikely that impacts to suitable habitat will isolate populations to the extent of forming new, genetically distinct populations.
Are impacts to suitable habitat likely to result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat?	**Unlikely** There are no apparent invasive fauna species which pose a threat to the Pale Imperial Hairstreak. Despite this however, to help manage pest species across the Project, Arrow have developed an overarching pest management strategy and developed a Pest Management Plan (PMP) for the broader SGP. This PMP will help to ensure that appropriate management strategies are implemented to control pest species that could occur within the Project footprint. Invasive weeds may threaten to compete with or inhibit growth of saplings of the larval host plant. To manage other invasive flora species listed under the *Biosecurity Act 2014*, Arrow have developed a Weed Management Plan (WMP) that will be implemented to mitigate the introduction and spread of invasive weeds. It is therefore considered unlikely that the Project will result in invasive species being established.
Are impacts to suitable habitat likely to introduce disease that may cause the population to decline?	**Unlikely** There are no known diseases listed as threatening processes for the Pale Imperial Hairstreak. It is considered unlikely that the construction and ongoing operation of the Project will introduce any that could cause potential populations to decline.
Are impacts to suitable habitat likely to interfere with the recovery of the species?	**Likely** Whilst no recovery plans or conservation objectives have been formerly outlined for the Pale Imperial Hairstreak, its reliance on *A. harpophylla* as a larval food source and for courtship clearly demonstrates that the protection of this habitat should be a key priority. The Project will require the removal of 0.3 ha of suitable habitat for this species which is likely to interfere with the recovery of this species, especially considering the

SRI Criteria	Project Response
	Projects' location within the known distribution of the Pale Imperial Hairstreak. Considering the scale of this proposed impact however, it is unlikely that this impact will be significant for the broader population.
Are impacts to suitable habitat likely to cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species?	**Likely** The most critical resources to the Pale Imperial Hairstreak are the presence and availability of the larval food plant and presence of attendant ants. Larvae are commonly found feeding on the soft foliage of shrubs of *A. harpophylla* 0.5-1 m tall (Braby, 2016), suggesting that recruitment within mature stands is a habitat requirement for the Pale Imperial Hairstreak. Additionally, attendant ants require mature trees where colonies are established in hollow branches, based on the ecology of butterfly species within the family Lycaenidae (Braby, 2016). The loss of mature stands of *A. harpophylla* within the Project footprint is therefore likely to disrupt ecologically significant locations for this species. Considering the scale of this proposed impact however, it is unlikely that this impact will be significant for the overall population.
It is considered **likely** that the Project will have a significant residual impact on the Pale Imperial Hairstreak.	

4.5.3 Impacts on habitat for Special Least Concern species

4.5.3.1 Short-beaked Echidna, *Tachyglossus aculeatus*

The Project will not result in any direct loss of potentially suitable habitat for Short-beaked Echidna. An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for Short-beaked Echidna has been provided in **Table 4.11**. The distribution of potentially suitable habitat for this species is presented in **Figure 3.11**.

Table 4.11 Significant Residual Impact Assessment for the Special Least Concern Short-beaked Echidna

SRI Criteria	Project Response
Are impacts to suitable habitat likely to result in a long-term decrease in the size of a local population?	**Unlikely** Whilst no Short-beaked Echidnas have been observed within the Study area, this species is well represented in the surrounding landscape with the closest record being located approximately 1.5 km to the West of the northern portion of the Study area (Arrow, 2024). In accordance with the methodologies outlined in the *Method for mapping matters of state environmental significance, Version 7* (DESI, 2024), known records are buffered by 1 km to derive a suitable habitat mapping layer. Considering the proximity of the nearest record, no suitable habitat for this species has been mapped within the Study area. Despite this however, Echidnas are known to occupy and forage within home ranges of up to 50 ha in size (BHA, 2024), and all habitats within the Study area are potentially suitable for this species. Given the abundance of available habitat within and adjacent to the Project area, the construction of the Projects is unlikely to lead to a long-term decrease in the local echidna population.

SRI Criteria	Project Response
Are impacts to suitable habitat likely to result in a reduced extent of occurrence for the species?	**Unlikely** The extent of occurrence is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon excluding cases of vagrancy (IUCN, 2024). Whilst a formal assessment of the Short-beaked Echidna's extent of occurrence hasn't been undertaken, the EOO tool embedded in the Atlas of Living Australia (ALA) indicates that the extent of occurrence for this species is will cover the entire Australian landmass. Considering the distribution of this species throughout Australia and the localised habitat fragmentation already present within the broader Study area, it is considered unlikely that the construction and ongoing operation of the Project will reduce the extent of occurrence for this species.
Are impacts to suitable habitat likely to result in fragmentation of an existing population?	**Unlikely** Short-beaked Echidnas are known to be sensitive to habitat loss, especially the loss of fallen logs, tree stumps and understory vegetation, they can occupy home ranges of up to 50 ha and are capable of traversing across open areas (BHA, 2024). Short-beaked Echidnas are more than capable of traversing cleared areas or partially fragmentated areas. Whilst the construction of this linear Project will lead to some fine scale habitat fragmentation, it is considered unlikely that these impacts will fragment an existing population.
Are impacts to suitable habitat likely to result in genetically distinct populations forming as a result of habitat isolation?	**Unlikely** There is currently only one Short-beaked Echidna species recognised across the Australian mainland. Short-beaked Echidnas are more than capable of traversing cleared areas or partially fragmentated areas. Whilst the construction of this linear Project will lead to some fine scale habitat fragmentation, it is considered unlikely that these impacts will result in genetically distinct populations forming as a result of habitat fragmentation.
Are impacts to suitable habitat likely to result in disruption to ecologically significant locations (breeding, feeding or nesting sites) or a species?	**Unlikely** Echidnas forage over large areas up to 50 ha and it is unlikely that any one location would be considered ecologically significant. The primary resource that has the potential to be disturbed by the Project are echidna burrows. Impacts on breeding habitat for echidna will be managed under Arrow's High-Risk Species Management Program approved under the NC Act, which restricts Considering the distribution of this species throughout Australia and the localised habitat fragmentation already present within the broader Study area, it is unlikely that the Project will disrupt ecologically significant locations for this species.
It is considered **unlikely** that the Project will have a significant residual impact on the Short-beaked Echidna.	

4.5.4 Impacts on mapped essential habitat

Pursuant to *Protecting biodiversity values, Table 1* of the SGP South EA, activities in Category C ESAs that are 'essential habitat' are limited to low impact petroleum activities only (i.e. no ground disturbance). The following impacts on essential habitat trigger a requirement to amend the EA as currently formulated:

- 6.7 ha of disturbance of mapped essential habitat for Kogan Waxflower (endangered) comprising three well pads, gathering RoW and extra work area associated with a well pad on Lot 10 RP166603; and
- 2.9 ha of disturbance of mapped essential habitat for the Yellow-bellied glider (vulnerable) comprising one well pad (and associated extra work area) and gathering RoW.

Flora surveys for Kogan Waxflower have been undertaken in accordance with the 'Flora Survey Guidelines – Protected Plants: *Nature Conservation Act 1992*' as described in **Section 2.2.1.1**. Areas of the Project footprint where no Kogan Waxflower individuals or habitat (records buffered by 100 m) have been identified will be included in clearing exemptions permits under the NC Act.

Impacts to Kogan Waxflower are managed under both the NC Act and the EPBC Act and there is considered to be no net loss of Kogan Waxflower and any offsets required under the State EO Act is a duplication of conservation requirements. Resultantly, there are no impacts to mapped essential habitat of Kogan Waxflower that require to be offset under the EO Act.

The impact areas of mapped essential habitat for the Kogan Waxflower have been added into the PEMs table (**Table 5.5**) for completeness, but are noted to not be an SRI under the EO Act.

4.5.5 Impacts to fish passage

The construction of the Project will involve crossing 19 Green (Low impact), seven Amber (Moderate impact) mapped waterway crossings. Crossing methodologies for the pipe installations are discussed in **Section 4.1.2**. All the creek crossings associated with the Project (1st and 2nd order drainage features) will be bed level crossings that will comply with the 'Accepted development requirements for operational work that is constructing or raising waterway barrier works" (ADR) (DAF 2018). There will be no culvert crossings or other structures placed in the waterways.

In order to assess the potential impacts to fish passage waterways have been reviewed based on their level of risk for impacts to fish passage. In the Study area the majority of the waterways are open depressions with no defined bed or banks and do not contain water outside of irregular flow events. These are considered to be low risk waterways and an SRI assessment is presented in **Table 4.12** There is only one waterway crossing on Eastern-Branch Creek (stream order 2) that contains pools of water north and south of the crossing location that followings an existing farm track as can be seen in **Plate 7**. Based on the crossing location it has also considered to be a low risk waterway crossing for impacts to fish passage.

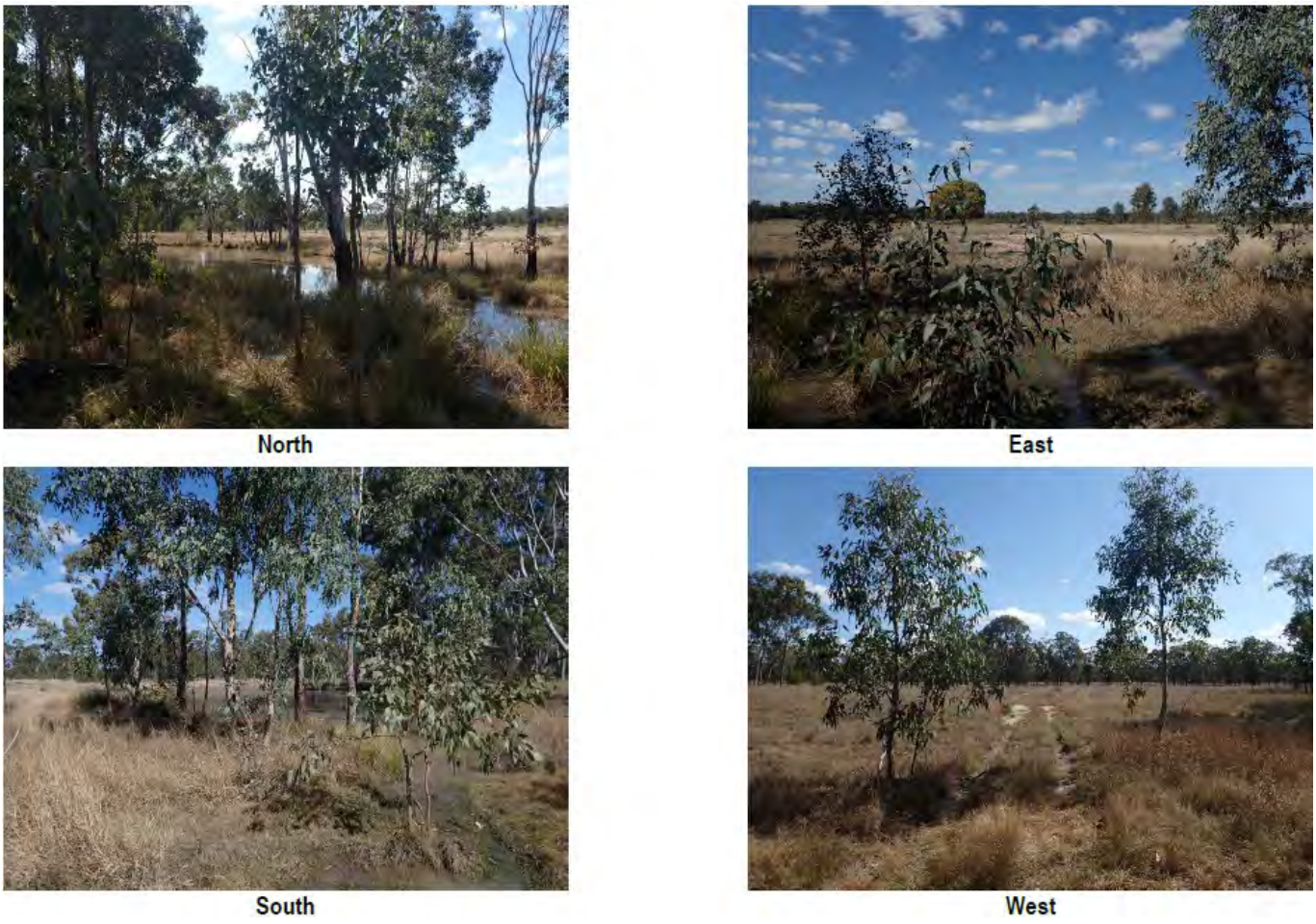

Plate 7 Photos at Eastern-Branch Creek crossing (EFS Taylors-T12 - 22/08/2024)

Pipe crossing works and the use of bed-level crossings will be undertaken in accordance with the accepted development requirements (ADR) of the waterway barrier (WWB) self-assessable code or the temporary WWB code.

An assessment undertaken in accordance with the SRI Guidelines (DEHP, 2014) for impacts to fish passage has been provided in **Table 4.12**. A conservative assessment has been undertaken based on the proposed works. An action is likely to have a significant impact on a waterway providing for fish passage if there is a real possibility that it will cause an impact on any of the criteria in the table below.

Table 4.12 Significant Residual Impact Assessment for impacts to fish passage

SRI CRITERIA	LOW RISK WATERWAY CROSSINGS
Result in the mortality or injury of fish	**Unlikely** These waterways are generally dry except during high flow events and construction will not occur during these times.
Result in conditions that substantially increase risks to the health, wellbeing and productivity of fish seeking passage such as through the depletion of fishes energy reserves, stranding, increased predation risks, entrapment or confined schooling behaviour in fish	**Unlikely** The construction will preferentially be undertaken during no/low flow periods, the area affected by construction is small and standing water in these waterways are uncommon.

SRI CRITERIA	LOW RISK WATERWAY CROSSINGS
Reduce the extent, frequency or duration of fish passage previously found at a site	**Unlikely** The crossing will be a bed-level crossing that will be constructed in accordance with the WWB ADR.
Substantially modify, destroy or fragment areas of fish habitat (including, but not limited to in-stream vegetation, snags and woody debris, substrate, bank or riffle formations) necessary for the breeding and/or survival of fish	**Unlikely** No significant habitat is present in these waterways and the profiles and substrates are reinstated to their original location.
Result in a substantial and measurable change in the hydrological regime of the waterway, for example, a substantial change to the volume, depth, timing, duration and frequency of flows	**Unlikely** The crossing will be a bed-level crossing that will be constructed in accordance with the WWB ADR.
Lead to significant changes in water quality parameters such as temperature, dissolved oxygen, pH and conductivity that provide cues for movement in local fish species	**Unlikely** The construction will preferentially be undertaken during low flow periods, the area affected by construction is small and standing water in these waterways are uncommon.
It is considered **Unlikely** that the Project will have a significant residual impact on fish passage for these waterways.	

5.0 Summary of proposed amendments

Arrow have prepared an EA amendment supporting information report that proposes to modify EA conditions to be consistent with other contemporary EAs and proposed Project impacts. This BIA has assessed current and proposed conditions against the proposed Project related to impacts to ESAs in **Section 5.1** and PEMs in **Section 5.2**.

Details of the assessment are included below, with the proposed conditions set out in the proposed SGP South EA amendments of the EA amendment supporting information report.

5.1 Environmentally Sensitive Areas

The current authorised disturbances to ESAs in the EA are Condition Biodiversity 8 and Despite Condition 8A. Arrow have prepared an EA amendment supporting information report that proposes to modify the ESA conditions to align to the contemporary definition of Category C ESAs and Project impacts consistent with the outcomes of the original approval. This BIA presents an assessment of impacts against the current approved EA and impacts against the proposed modified conditions.

For the purposes of this assessment non-essential petroleum activities proposed within ESAs for the SGP South include:

- extra work areas, such as those required to accommodate well pads on sloping topography;
- communication tower;
- proposed borrow pit;
- laydown areas; and
- a mobile drilling camp.

5.1.1 Impact assessment of the approved Environmental Authority

The assessment of impacts against the current Condition 8: *Protecting biodiversity values, Table 1—Authorised petroleum activities in environmentally sensitive areas and their protection zones* is provided in **Table 5.1**.

Condition Biodiversity 8A: *Protecting biodiversity values, Table 2 – Maximum significant disturbance* is a despite condition to Biodiversity 8 and **Table 5.2** presents proposed impacts compared to the approved despite condition.

The current EA does not have any despite conditions related to the Primary protection zone (PPZ) or Secondary protection zone (SPZ) of the environmentally sensitive area. This is addressed in **Section 5.1.2** with proposed amendments.

Table 5.1 Proposed Activities Affecting Category B and Category C ESAs

ESA Type	Detail	Allowable activities	Proposed activities
Category B			
Endangered RE	RE 11.3.1	Low impact petroleum activities only	RoW – 0.3 ha **Total disturbance – 0.3 ha**

ESA Type	Detail	Allowable activities	Proposed activities
Category C			
Of concern RE	RE 11.3.25	Low impact petroleum activities only	RoW – 0.2 ha
Essential habitat for endangered wildlife	Kogan Waxflower	Low impact petroleum activities only	**Total disturbance – 6.7 ha**
Essential habitat for vulnerable wildlife	Yellow-bellied glider	Low impact petroleum activities only	**Total disturbance – 2.9 ha**
'state forests' or 'timber reserves'		Only essential petroleum activities only	Access Track Only - 16.2 ha Communication Tower - 0.5 ha EWA - 0.1 ha EWA (Pipeline Infrastructure) - 0.8 ha Pad - 43.0 ha ROW - 76.7 ha **Total disturbance – 137.3 ha**
		Cumulative disturbance in Category C ESA	**144.2 ha**
Category B PPZ			
Endangered RE	PPZ (within 200 m)	Essential petroleum activities only	EWA (Pad) - 1.0 ha EWA (Pipeline Infrastructure) - 0.3 ha Pad - 2.9 ha ROW - 5.3 ha **Total disturbance – 9.5 ha** **Not authorised – 1.3 ha**
Category B SPZ			
Endangered RE	PPZ (within 300 m)	Essential petroleum activities only	EWA (Pipeline Infrastructure) - 0.1 ha Pad - 0.9 ha ROW - 2.4 ha **Total disturbance – 3.4 ha** **Not authorised – 0.1 ha**
Category C PPZ			
Essential habitat for endangered or vulnerable wildlife, Of concern REs and State Forests	PPZ (within 200 m)	Essential petroleum activities only	Access Track Only - 3.7 ha Camp - Mobile Drilling - 0.8 ha EWA (Pad) - 0.1 ha EWA (Pipeline Infrastructure) - 1.6 ha Laydown – Local - 2.6 ha Pad - 10.7 ha ROW - 23.6 ha

ESA Type	Detail	Allowable activities	Proposed activities
			Road and intersection upgrades - 23.1 ha **Total disturbance – 66.1 ha** **Not authorised – 5.1 ha**

Table 5.2 Protecting biodiversity values, Table 2 – Maximum significant disturbance

ACTIVITY(IES)	LOCATION	PROJECT IMPACTS		CURRENT EA APPROVED		AMENDMENT REQUIRED?
				DISTURBANCE AREA	MAXIMUM FOOTPRINT	
Ground disturbance in a Category B Environmentally Sensitive Area	PL493	0.3 ha	0.3 ha	6 ha	17 ha	Not required
	PL1039	0		11 ha		Not required
Ground disturbance in a Category C Environmentally Sensitive Area	PL185	0	144.2 ha	0.5 ha	1,657 ha	Not required
	PL493	6.9 ha		5 ha		6.9 ha
	PL1039	0		10 ha		Not required
	PL1040	137.3 ha		1,640 ha		Not required
	PL1041	0		0.5 ha		Not required
	PL1043	0		1 ha		Not required

5.1.2 Impact assessment of the proposed modified conditions

It is proposed to add an extra condition to allow non-essential petroleum activities in the PPZ and SPZ of ESAs. It is also noted that for completeness the inclusion of DETSI definition of Category C Protected Wildlife Habitat has been included for the assessment as its currently not defined in the EA at present.

> *Biodiversity 7 Extra work areas (EWAs) are authorised in areas clear of native vegetation, including primary protection zones (PPZ) and secondary protection zones (SPZ).*

Table 1 in condition Biodiversity 8 is proposed to be modified and an impact assessment against the updated conditions are presented in **Table 5.3**.

Table 5.3 Proposed Activities Affecting Category B and Category C ESAs

ESA Type	Detail	Allowable activities	Proposed activities
Category B			
Endangered RE	RE 11.3.1	Low impact petroleum activities only	RoW – 0.3 ha **Total disturbance – 0.3 ha**

ESA Type	Detail	Allowable activities	Proposed activities
Category C			
Of concern RE	RE 11.3.25	Low impact petroleum activities only	RoW – 0.2 ha **Total disturbance – 0.2 ha**
Essential habitat for endangered wildlife	Kogan Waxflower	Low impact petroleum activities only	**Total disturbance – 6.7 ha**
Essential habitat for vulnerable wildlife	Yellow-bellied glider	Low impact petroleum activities only	**Total disturbance – 2.9 ha**
'Protected wildlife habitat'		Only essential petroleum activities permitted	Access Track Only - 10.3 ha Borrow Pit - 0.2 ha Communication Tower - 0.5 ha EWA - 0.1 ha EWA (Pad) - 1.0 ha EWA (Pipeline Infrastructure) - 2.2 ha Laydown - Local - <0.1 ha Pad - 58.2 ha ROW - 102.6 ha Road and intersection upgrades - 10.6 ha **Total disturbance – 185.7 ha**
'state forests' or 'timber reserves'		Only essential petroleum activities only	Access Track Only - 16.2 ha Communication Tower - 0.5 ha EWA - 0.1 ha EWA (Pipeline Infrastructure) - 0.8 ha Pad - 43.0 ha ROW - 76.7 ha **Total disturbance – 137.3 ha**
		Cumulative disturbance in Category C ESA	**197.9 ha**
Category B PPZ			
Endangered RE	PPZ (within 200 m)	Essential petroleum activities only	EWA (Pad) - 1.0 ha EWA (Pipeline Infrastructure) - 0.3 ha Pad - 2.9 ha ROW - 5.3 ha **Total disturbance – 1.3 ha**
Category B SPZ			
Endangered RE	PPZ (within 300 m)	Essential petroleum activities only	EWA (Pipeline Infrastructure) - 0.1 ha Pad - 0.9 ha ROW - 2.4 ha **Total disturbance – 0.1 ha**

ESA Type	Detail	Allowable activities	Proposed activities
Category C PPZ			
Essential habitat for endangered or vulnerable wildlife, Of concern REs, State Forests and protected wildlife habitat	PPZ (within 200 m)	Essential petroleum activities only	Access Track Only - 16.1 ha Borrow Pit - 2.1 ha Camp - Mobile Drilling - 0.8 ha EWA - <0.1 ha EWA (Pad) - 0.1 ha EWA (Pipeline Infrastructure) - 1.9 ha Laydown - Local - 2.6 ha Pad - 14.8 ha ROW - 38.9 ha Road and intersection upgrades - 27.8 ha **Total disturbance – 105.0 ha**

Table 5.4 Schedule F, Table 2 – Maximum ESA disturbance

ACTIVITY(IES)	PROJECT DISTURBANCE AREA	MAXIMUM ESA DISTURBANCE AREA	AMENDMENT REQUIRED?
Ground disturbance in a Category B Environmentally Sensitive Area	0.3 ha	17 ha	Not required
Ground disturbance in a Category C Environmentally Sensitive Area	197.9 ha	1,657 ha	Not required
Ground disturbance within a Category C Environmentally Sensitive Area 'Of Concern RE' (OCRE)	1.6 ha	1.6 ha	Proposed condition
Ground disturbance within a Category C Environmentally Sensitive Area 'Mapped as 'Essential Habitat'	6.7 ha	6.7 ha	Proposed condition
Ground disturbance within a Category C Environmentally Sensitive Area 'Protected Wildlife Habitat' that is Category A, B or C on the RVMM[1]	185.7 ha	185.7 ha	Proposed condition
Ground disturbance within a Category C Environmentally Sensitive Area Primary Protection zones	To the extent they are required for authorised activities within the SGP South Amendment 2 Maximum Boundary in **Schedule F, Figure 1 – SGP South Amendment 1 Maximum Boundary**		Proposed condition
Ground disturbance within a Category B Environmentally Sensitive Area Primary Protection zones			Proposed condition

[1] RVMM – Regulated Vegetation Management Map

ACTIVITY(IES)	PROJECT DISTURBANCE AREA	MAXIMUM ESA DISTURBANCE AREA	AMENDMENT REQUIRED?
Ground disturbance within a Category B Environmentally Sensitive Area Secondary Protection zones			Proposed condition

5.2 Prescribed Environmental Matters

It is proposed to authorise impacts to the identified PEMs values via amendments to *Protecting biodiversity values, Table 3 – Significant residual impacts to prescribed environmental matters* as set out in **Table 5.4**. These PEMs are based on the prescribed environmental matters are outlined in Schedule 2 of the Environmental Offsets Regulation 2014 and the impacts identified in **Section 4.0** of this report. PEMs in **Table 5.4** are included from the currently approved EA and any additional PEMs impacted identified in this BIA.

Table 5.5 Proposed amendments to *Protecting biodiversity values, Table 3 – Significant residual impacts to prescribed environmental matters*

Prescribed Environmental Matter	SGP South Impacts Amendment #1	Significant Residual Impact (SRI) and Offset required (Yes/No/NA)	Existing approved 'Maximum extent of impact'	Amendment required
Endangered regional ecosystem				
11.3.1 (remnant)	0.3 ha	Yes	MNES[1]	Not required
11.4.3 (remnant)	0	N/A	MNES[1]	Not required
11.4.12 (remnant)	0	N/A	5 ha	Not required
Of concern regional ecosystem				
11.3.2 (remnant)	0	N/A	1 ha	Not required
11.3.4 (remnant)	0	N/A	9 ha	Not required
11.3.21 (remnant)	0	N/A	12 ha	Status change to Of concern
Regional ecosystems (not within an urban area) that intersect a wetland on the vegetation management wetlands map				
RE 11.3.25	0	N/A	0.5 ha	Not required
RE 11.5.1	0	N/A	0.5 ha	Not required
RE 11.5.20	0	N/A	0.5 ha	Not required

Prescribed Environmental Matter	SGP South Impacts Amendment #1	Significant Residual Impact (SRI) and Offset required (Yes/No/NA)	Existing approved 'Maximum extent of impact'	Amendment required
Regional ecosystems (not within an urban area) within the defined distance from the defining banks of a relevant watercourse on the vegetation management watercourse map				
RE 11.3.4 (16c)	0	N/A	2 ha	Not required
RE 11.3.14 (18a)	0	N/A	0.5 ha	Not required
RE 11.3.25 (16a)	0.2 ha	Yes	18 ha	Not required
RE 11.4.3 (25a)	0	N/A	1 ha	Not required
RE 11.4.12 (BVG 17a)	0	N/A	1 ha	Not required
RE 11.5.1 (18b)	0.6 ha	Yes	10	Not required
RE 11.5.4 (18b)	0.1 ha	Yes	5 ha	Not required
RE 11.5.20 (13d)	0.2 ha	Yes	11 ha	Not required
RE 11.7.4 (12a)	0.4 ha	Yes	2 ha	Not required
RE 11.7.7 (12a)	0.1 ha	Yes	1 ha	Not required
Essential habitat (not in an urban area) for vulnerable wildlife				
Petaurus australis australis (Yellow-bellied glider (southern subspecies))	2.9 ha	Yes	N/A	2.9 ha
Essential habitat (not in an urban area) for endangered wildlife				
Phascolarctos cinereus (Koala)	0	N/A	MNES[1]	Status change to endangered
Philotheca sporadica (Kogan Waxflower)	6.7 ha	No	N/A	Not required
Hemiaspis damelii (Grey Snake)	0	N/A	35 ha	Not required
Connectivity areas				
Connectivity areas	178.3 ha	Yes	13.9 ha	178.3 ha
Wetlands and watercourses				
A wetland in a wetland protection area shown on the map of referable wetlands	NA	NA	NA	NA

Prescribed Environmental Matter	SGP South Impacts Amendment #1	Significant Residual Impact (SRI) and Offset required (Yes/No/NA)	Existing approved 'Maximum extent of impact'	Amendment required
A wetland of high ecological significance shown on the Map of referable wetlands	0	N/A	0.5 ha	Not required
Designated precincts in a strategic environmental area				
Designated precinct in a strategic environmental area	NA	NA	NA	NA
Protected wildlife habitat				
An area shown as high-risk area on the flora survey trigger map that contains plants that are endangered or vulnerable wildlife				
Solanum papaverifolium	0	N/A	1 ha	Not required
Fimbristylis vagans	0	N/A	2.7 ha	Not required
*Philotheca sporadica (*Kogan Wax Flower).	In accordance with the protected plant clearing framework and relevant protected plant clearing permit under the *Nature Conservation Act 1992*			#TBC
An area not shown as high-risk area on the flora survey trigger map that contains plants that are endangered or vulnerable wildlife				
*Philotheca sporadica (*Kogan Wax Flower).	In accordance with the protected plant clearing framework and relevant protected plant clearing permit under the *Nature Conservation Act 1992*			#TBC
Habitat for an animal that is endangered wildlife				
Phascolarctos cinereus, Koala	222.8 ha	No	MNES[1]	Status change to endangered
Hemiaspis damelii, Grey Snake	1.0 ha	Yes	N/A	1.0 ha
Habitat for an animal that is vulnerable wildlife				
Acanthophis antarcticus, Death Adder	0	N/A	3.2 ha	Not required
Adclarkia cameroni, Brigalow Woodland Snail	1.0 ha	Yes	N/A	1.0 ha
Calyptorhynchus lathami lathami, Glossy Black-cockatoo	76.6 ha	Yes	3.2 ha	76.6 ha
Furina dunmalli ,Dunmall's Snake	0	N/A	MNES[1]	Not required

Prescribed Environmental Matter	SGP South Impacts Amendment #1	Significant Residual Impact (SRI) and Offset required (Yes/No/NA)	Existing approved 'Maximum extent of impact'	Amendment required
Grantiella picta, Painted Honeyeater	0.4 ha	Yes	N/A	0.4 ha
Jalmenus eubulus, Pale Imperial Hairstreak	0.3 ha	Yes	N/A	0.3 ha
Nyctophilus corbeni, South-eastern Long-eared Bat	0	N/A	MNES[1]	Not required
Stagonopleura guttata, Diamond Firetail	175.8 ha	Yes	N/A	175.8 ha
Habitat for an animal that is special least concern wildlife				
Tachyglossus aculeatus, Short-beaked Echidna	0	N/A	45.2 ha	Not required
Protected areas				
National park	NA	NA	NA	NA
Regional park	NA	NA	NA	NA
Nature refuge	NA	NA	NA	NA
Highly protected zones of State marine parks				
Conservation park zone	NA	NA	NA	NA
Marine national park zone	NA	NA	NA	NA
Preservation zone	NA	NA	NA	NA
Other zones	NA	NA	NA	NA
Fish habitat areas				
A declared fish habitat area	NA	NA	NA	NA
Waterway providing for fish passage				
Fish passage (not in an urban area)	0	N/A	82 ha	Not required
Marine plants				
Marine plant (not in an urban area)	NA	NA	NA	NA

Prescribed Environmental Matter	SGP South Impacts Amendment #1	Significant Residual Impact (SRI) and Offset required (Yes/No/NA)	Existing approved 'Maximum extent of impact'	Amendment required
Legally secured offset area				
Legally secured offset area	NA	NA	NA	NA

[1] Impact managed under EPBC approval 2010/5344

6.0 References

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Appendix A

EPBC Approval 2010/5344

Approval

Surat Gas Expansion Project (EPBC 2010/5344)

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

person to whom the approval is granted	Arrow Energy Pty Ltd
proponent's ABN	ABN: 73 078 521 936
proposed action	To expand coal seam gas operations in the Surat Basin, Queensland, as described in the referral received under the EPBC Act on 2 February 2010; and as described in the Surat Gas Project Environmental Impact Statement (March 2012) and Supplementary Report to the Environmental Impact Statement (June 2013).
decision	To approve the proposed action for each of the following controlling provisions: • Listed threatened species and communities (sections 18 and 18A) • Listed migratory species (sections 20 and 20A) • A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
Conditions of approval	This approval is subject to the conditions specified below.
expiry date of approval	This approval has effect until **31 December 2080**.

Decision-maker	Greg Hunt
name and position	The Hon Greg Hunt MP Minister for the Environment
signature	
date of decision	19:12:2013

Conditions of approval

1. The **Minister** may determine that a plan, strategy or program approved by the Queensland Government satisfies a plan required under these conditions.

Disturbance Limits

2. For the purpose of the action, the **approval holder** must not take any action outside the **project area**.
3. The action is limited to a maximum of 6,500 coal seam gas production wells and associated infrastructure.
4. The **approval holder** must not undertake hydraulic fracturing.
5. To protect **EPBC listed species** and **EPBC communities** within the **project area** the maximum disturbance limits in Table 1 apply to the project. The **approval holder** must not exceed these disturbance limits.

Table 1: Whole of project maximum disturbance limits

Terrestrial species	**Maximum disturbance (hectares) to core habitat**
Curly-bark Wattle, *Acacia curranii*	1210
Hando's Wattle, *Acacia handonis*	1210
Belson's Panic, *Homopholis belsonii*	140
Lobed Blue Grass, *Bothriochloa biloba*	305
Kogan Waxflower, *Philotheca sporadica*	480
Prostanthera sp Dunmore	380
Small-leaved Denhamia, *Denhamia parvifolia*	50
Calytrix gurulmundensis	1210
Ooline, *Cadellia pentastylis*	No disturbance
Finger Panic Grass, *Digitaria porrecta*	174
Austral Toadflax, *Thesium australe*	160
Acacia lauta	990
Cobar Greenhood Orchid, *Pterostylis cobarensis*	2 170
Xerothamnella herbacea	110
Hawkweed, *Picris evae*	120
Austral Cornflower, *Rhaponticum australe*	160
Eucalyptus virens	170
King Blue-grass, *Dichanthium queenslandicum*	160
Queensland White-gum, *Eucalyptus argophloia*	10
Macrozamia machinii	No disturbance
South-eastern Long-eared Bat, *Nyctophilus corbeni*	4 080
Dunmall's Snake, *Furina dunmalli*	4 400
Five-clawed Worm-skink, *Anomalopus mackayi*	560
Squatter Pigeon (Southern), *Geophaps scripta scripta*	3261

Regent Honeyeater, *Anthochaera phrygia*	20
Collared Delma, *Delma torquata*	90
Yakka Skink, *Egernia rugosa*	310
Australian Painted Snipe, *Rostratula australis*	5
EPBC Communities	**Maximum disturbance (hectares)**
Brigalow (*Acacia harpophylla* dominant and co-dominant)	106
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	8
Weeping Myall Woodlands	1
Natural Grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	No disturbance
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	No disturbance
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	No disturbance

6. To protect **EPBC listed species and communities** within the **project area** the maximum disturbance limits in Table 2 apply to **Stage 1**. The **approval holder** must not exceed these disturbance limits.

Table 2: Maximum disturbance limits for Stage 1

Terrestrial species	**Maximum disturbance (hectares) to core habitat**
South-eastern Long-eared Bat, *Nyctophilus corbeni*	167
Dunmall's Snake, *Furina dunmalli*	66
Five-clawed Worm-skink, *Anomalopus mackayi*	2
Squatter Pigeon (Southern), *Geophaps scripta scripta*	203
Regent Honeyeater, *Anthochaera phrygia*	1
Collared Delma, *Delma torquata*	11
Yakka Skink, *Egernia rugosa*	19
EPBC Communities	**Maximum disturbance (hectares)**
Brigalow (*Acacia harpophylla* dominant and co-dominant)	39
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	8

EPBC Species Impact Management and Offset Plan

EPBC Species Impact Management and Offset Plan – Stage 1

7. An EPBC Species Impact Management and Offset Plan for **Stage 1** must be submitted for approval of the **Minister** at least 3 months prior to **commencement**, and must include:

    (a) measures to report the methodology and results of **pre-clearance surveys,** and quantification of actual impacts, in the annual reporting required by condition 28. **Pre-clearance surveys** must be undertaken in accordance with the **Department's survey guidelines** in effect at the time of the survey or other survey methodology approved by the **Department** in writing;

(b) a map of the location of each **EPBC listed threatened species** and its habitat or **EPBC community** in relation to infrastructure and proposed disturbance for **Stage 1**;

(c) potential threats and **impacts** to **EPBC listed species** and **EPBC communities** from **Stage 1**;

(d) a description of the measures that will be taken to avoid, mitigate and manage **impacts** to the **EPBC listed species** and its habitat, including to the **Murray Cod** and **Fitzroy River Turtle,** or an **EPBC community**;

(e) measures to report to the **Department** on the occurrence and circumstances of **EPBC listed species** deaths as a result of the action and actions taken to reduce the likelihood of any such circumstance reoccurring;

(f) a monitoring program to determine the success of mitigation and management measures and inform the next Stage of the EPBC Species Impact Management and Offset Plan to ensure adaptive management for the duration of the project approval;

(g) a discussion of relevant **conservation advice**, **recovery plans** and **threat abatement plans** and how the EPBC Species Impact Management and Offset Plan - **Stage 1** is consistent with these documents;

(h) details of the following minimum offset areas for **Stage 1** including, for each area, the location, tenure, site description and map of environmental values:

i. 112 hectares for Brigalow (*Acacia harpophylla* dominant and co-dominant);

ii. 30 hectares Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions;

iii. 80 hectares for Yakka Skink, *Egernia rugosa*;.

iv. 42 hectares for Collared Delma, *Delma torquata*;

v. 230 hectares for Dunmall's Snake, *Furina dunmalli*;

vi. 545 hectares for Squatter Pigeon (Southern), *Geophaps scripta scripta*;

vii. 6.5 hectares for Five-clawed Worm-skink, *Anomalopus mackayi*;

viii. 4 hectares for Regent Honeyeater, *Anthochaera phrygia*; and

ix. 765 hectares for South-eastern Long-eared Bat, *Nyctophilus corbeni.*

(i) a process for any significant **impact** to an **EPBC listed species** or **EPBC community** for **Stage 1**, where the species or community is not identified in Table 2, to be offset in accordance with the **EPBC Act Offsets Policy**;

(j) an offset area management plan for each offset area, which sets out management measures that will be implemented to improve the offset site for the respective **EPBC species** and/or **EPBC community**; and

(k) a timeline for when actions identified in the EPBC Species Impact Management and Offset Plan will be implemented and for legally securing offsets including, for each area, the proposed legal mechanism for securing the offset. Offsets for **Stage 1** must be legally secured prior to **commencement** of **Stage 2**.

8. The EPBC Species Impact Management and Offset Plan for **Stage 1** must be peer reviewed by a **suitably qualified ecologist** approved by the **Minister** in writing. The peer review must be submitted to the **Minister** together with the EPBC Species Impact Management and Offset Plan for **Stage 1** and a statement from the **suitably qualified ecologist** stating that they carried out the peer review and endorse the findings of the peer review.

9. The **approval holder** must not **commence** the action until the EPBC Species Impact Management and Offset Plan for **Stage 1** has been approved by the **Minister** in writing.

EPBC Species Impact Management and Offset Plan – Stages 2 to 4

10. The **approval holder** must update the EPBC Species Impact Management and Offset Plan for the next **development stage** (i.e. **Stage 2, Stage 3** and **Stage 4**) and submit for approval of the **Minister** at least 3 months prior to **commencement** of each **development stage**. Each updated plan must include:

    (a) the information required for the EPBC Species Impact Management and Offset Plan in conditions 7 (a) to (g) and conditions 7 (j) and 7 (k) for the respective **development stage**;

    (b) where **impacts** are unavoidable, an offset strategy to compensate for residual **impacts** to each **EPBC species** or **EPBC community** for that **development stage** in accordance with the **EPBC Act Offsets Policy**. The offset strategy must:

        i. demonstrate how the offset builds on offsets secured as part of the EPBC Species Impact Management and Offset Plan – **Stage 1** and any other **development stage** and, where possible, will contribute to a larger strategic offset for whole of project **impacts**;

        ii. identify land (including a map, site description and shapefile) that has or will be acquired and how it has been or will be legally secured;

        iii. include a detailed discussion of the quality, condition, site context and environmental values of the impact and offset site relevant to the **EPBC species** or **EPBC community** being offset;

        iv. include a description of potential risks to successful implementation of the offset, including a description of contingency measures that would be implemented to mitigate against these risks; and

        v. discuss connectivity of the offset area with other habitats and biodiversity corridors.

    (c) a reconciliation of **impacts** against whole of project disturbance limits. To incentivise avoidance, the **approval holder** is only required to offset realised **impacts**. Where the full **impact** from **Stage 1, Stage 2** or **Stage 3** that has been offset is not realised, the balance of the offset can be transferred to a future offset liability for a future **development stage** for this project.

11. The updated EPBC Species Impact Management and Offset Plan for each **development stage** must be peer reviewed by a **suitably qualified ecologist** approved by the **Minister** in writing. The peer review must be submitted to the **Minister** together with the EPBC Species Impact Management and Offset Plan for each **development stage** and a statement from the **suitably qualified ecologist** stating that they carried out the peer review and endorse the findings of the peer review.

12. The **approval holder** must not **commence Stage 2, Stage 3** or **Stage 4** until the EPBC Species Impact Management and Offset Plan for that **development stage** has been approved by the **Minister** in **writing**. The approved EPBC Species Impact Management and Offset Plan for each **development stage** must be implemented.

Note 1: The Minister may determine that a plan, strategy or program approved by the Queensland Government satisfies the requirements for the EPBC Species Impact Management and Offset Plan under these conditions.

Note 2: Offsets for some species may be accommodated within ecological communities or overlap State approval requirements or other species habitat requirements, as long as they meet the requirements of these conditions of approval in respect of each individual species being offset.

Coal Seam Gas Water Monitoring and Management Plan

Stage 1 CSG Water Monitoring and Management Plan

13. Prior to **commencement**, the proponent must submit a Stage 1 Coal Seam Gas Water Monitoring and Management Plan (Stage 1 CSG WMMP) for the approval of the **Minister,** who may seek the advice of an **expert panel**. The Stage 1 CSG WMMP must include:

    (a) an analysis of the results of the most recent **OGIA model** (built or endorsed by **OGIA**), relevant to all of the project's tenement areas;

    (b) a fit for purpose numerical simulation to assess potential impacts on water resources arising from the action in the project area, subsequent surface water-groundwater interactions in the Condamine Alluvium and impacts to dependent ecosystems;

    (c) an assessment of potential **impacts** from the action on non-spring based groundwater dependent ecosystems through potential changes to surface-groundwater connectivity and interactions with the sub-surface expression of groundwater;

    (d) an assessment of predicted project wide groundwater drawdown levels and pressures from the action, together with confidence levels;

    (e) parameters and a sampling regime to establish baseline data for surface and groundwater resources that may be impacted by the action, including: surface water quality and quantity in the **project area**, and upstream and downstream of potential impact areas; groundwater quality, levels and pressures for areas that may be **impacted** by the project; and for determining connectivity between surface water and groundwater that may be **impacted** by the project;

    (f) a best practice baseline monitoring network that will enable the identification of spatial and temporal changes to surface water and groundwater. This must include a proposal for aquifer connectivity studies and monitoring of relevant aquifers to determine hydraulic connectivity (including potential groundwater dependence of Long Swamp and Lake Broadwater) and must also enable monitoring of all aquatic ecosystems that may be **impacted** by the action;

    (g) a program to monitor subsidence **impacts** from the action, including trigger thresholds and reporting of monitoring results in annual reporting required by condition 28. If trigger thresholds are exceeded, the **approval holder** must develop and implement an action plan to address impacts within 90 calendar days of a trigger threshold being exceeded;

    (h) provisions to make monitoring results publicly available on the **approval holder's** website to facilitate a greater understanding of cumulative **impacts**;

    (i) a discussion on how the **approval holder** is contributing to the **Joint Industry Plan,** including its periodic review. The **approval holder** must contribute to the **Joint Industry Plan** and comply with any part of the **Joint Industry Plan**, or future iterations of the **Joint Industry Plan**, that applies to the **approval holder**;

    (j) a groundwater early warning monitoring system, including:

        i. groundwater drawdown limits for all consolidated aquifers potentially impacted by the action, excluding the Walloon Coal Measures;

        ii. for the Condamine Alluvium, appropriate triggers and groundwater limits and a rationale for their selection;

        iii. early warning indicators and trigger thresholds, including for Lake Broadwater, Long Swamp and other groundwater dependent ecosystems that may potentially be impacted by the action, including

those that may occur outside the **project area** and may be impacted by the action; and

iv. investigation, management and mitigation actions, including substitution and/or groundwater repressurisation, for both early warning indicators and trigger thresholds to address flux impacts on the Condamine Alluvium.

(k) early warning indicators and trigger thresholds, including corrective actions for both early warning indicators and trigger thresholds, for aquatic ecology and aquatic ecosystems;

(l) a CSG water management strategy for produced salt/brine, which discusses how co-produced water and brine will be managed for the action, including in the context of other coal seam gas activities in the Surat Basin;

(m) an analysis of how the **approval holder** will utilise beneficial use and/or groundwater repressurisation techniques to manage produced CSG water from the action, and how any potential adverse **impacts** associated with groundwater repressurisation will be managed;

(n) a discharge strategy, consistent with the recommendations and requirements of the Department of the Environment and Heritage Protection in its **Assessment Report** (pages 94 to 95 and pages 254 to 255) and that includes scenarios where discharge may be required, the quality of discharge water (including water treated by reverse osmosis), the number and location of monitoring sites (including upstream and downstream sites), frequency of monitoring and how the data from monitoring will be analysed and reported, including recommendations on any changes or remedial actions that would be required;

(o) a flood risk assessment for processing facilities and any raw co-produced water and brine dams, which addresses flood risks to the environment from the action in the case of a 1:1000 ARI event. The risk assessment should estimate the consequences if major project infrastructure was subject to such an event, including release of brine and chemicals into the environment;

(p) a cumulative **impact** assessment based on the outputs of the **OGIA model** which integrates groundwater model outputs with known and potential groundwater dependent ecosystems and presents the outputs in map form. Contribute to investigations coordinated through the OGIA to assess hydrological and ecological characteristics of **impacted** groundwater dependent ecosystems;

(q) details of performance measures; annual reporting to the **Department**; and publication of reports on the internet; and

(r) an explanation of how the Stage 1 CSG WMMP will contribute to work undertaken by other CSG proponents in the Surat Basin to understand cumulative **impacts**, including at the local and regional scale, and maximise environmental benefit.

14. The Stage 1 CSG WMMP must be peer reviewed by a **suitably qualified water resources expert/s** approved by the **Minister** in writing. The peer review must be submitted to the **Minister** together with the Stage 1 CSG WMMP and a statement from the **suitably qualified water resources expert/s** stating that they carried out the peer review and endorse the findings of the Stage 1 CSG WMMP.

15. The **approval holder** must not exceed the groundwater drawdown or groundwater limits for each aquifer specified in the Stage 1 CSG WMMP.

16. Unless otherwise agreed in writing by the **Minister**, the **approval holder** must not **commence** the action until the Stage 1 CSG WMMP is approved in writing by the **Minister**. The approved Stage 1 CSG WMMP must be implemented.

Note 3: to ensure efficiency the approval holder may prepare and align the Stage 1 WMMP with the requirements of the Queensland Government, as long as the relevant matters under the conditions of this approval are clearly and adequately addressed.

Stage 2 CSG Water Monitoring and Management Plan

17. Prior to **Stage 2** the **approval holder** must submit a Stage 2 Coal Seam Gas Water Monitoring and Management Plan (Stage 2 CSG WMMP) to the **Minister** for approval, who may seek the advice of an **expert panel.** The Stage 2 CSG WMMP must:

    (a) include all matters in the Stage 1 CSG WMMP, and discuss how the Stage 1 CSG WMMP is informing adaptive management for the Stage 2 CSG WMMP;

    (b) include any updated modelling for the project, including in respect of the **OGIA model** or any updates to the **OGIA model** by **OGIA**;

    (c) include an explanation of how the **approval holder** will contribute to the **Condamine Interconnectivity Research Project**. The Stage 2 CSG WMMP must present the findings of the Condamine Interconnectivity Research project and any modelling done by the **OGIA** to validate predicted drawdown and a review of trigger thresholds and corrective actions for the action;

    (d) report on the potential for flow reversal from the Condamine Alluvium to underlying aquifers, based on data obtained during the Stage 1 CSG WMMP;

    (e) review and update the monitoring network in Stage 1 WMMP to reflect changes in understanding of **impacts** to water resources, including from baseline monitoring and relevant research;

    (f) identify any predicted changes in stream connectivity due to groundwater drawdown from the action and assess potential impacts to groundwater dependent ecosystems due to any predicted changes in stream connectivity, including to water quality, quantity and ecology;

    (g) address any uncertainty in the groundwater-dependency of ecosystems and springs with supporting evidence from field-based investigations for any groundwater-dependent ecosystems and springs confirmed in the **OGIA model**;

    (h) provide details of an ongoing monitoring plan that:

        i. sets out the frequency of monitoring and rationale for the frequency;

        ii. includes continued collection of baseline data for each monitoring site over the life of the project;

        iii. outlines the approach to be taken to analyse the results including the methods to determine trends to indicate potential **impacts**; and

        iv. builds on the groundwater early warning system required at condition 13 (j) and sets out early warning indicators and trigger thresholds and limits for groundwater and surface water.

    (i) include a risk based exceedance response plan that details the actions the **approval holder** will take and the timeframes in which those actions will be undertaken if: early warning indicators and trigger threshold values contained in the Stage 2 CSG WMMP are exceeded, or there are any emergency discharges.

18. The Stage 2 CSG WMMP must be peer reviewed by a **suitably qualified water resources expert/s** approved by the **Minister** in writing. The peer review must be submitted to the **Minister** together with the Stage 2 CSG WMMP and a statement from the **suitably qualified water resources expert/s** stating that they carried out the peer review and endorse the findings of the Stage 2 CSG WMMP.

19. The **approval holder** must not exceed the groundwater drawdown or groundwater limits specified in the Stage 2 CSG WMMP.

20. The **Minister** may direct in writing that the **approval holder** cease water/gas extraction and/or water discharge or use if an early warning indicator, trigger threshold or limit is exceeded, and if the **Minister** is not satisfied that the action proposed or taken by the proponent will remedy the situation. The **Minister** may direct the proponent to implement alternative action at the expense of the proponent.

Note 4: The proponent will be provided with a reasonable opportunity to comment on any such direction before it is required to be implemented.

21. Unless otherwise agreed by the **Minister** in writing, the Stage 2 CSG WMMP must be approved in writing by the **Minister** prior to first extraction of gas. The approved Stage 2 CSG WMMP must be implemented. The Stage 1 CSG WMMP will apply until the commencement of the approved Stage 2 CSG WMMP.

Note 5: to ensure efficiency the approval holder may prepare and align the Stage 2 WMMP with the requirements of the Queensland Government, as long as the relevant matters under the conditions of this approval are clearly and adequately addressed.

Revision of the Stage 2 CSG WMMP

22. To ensure an adaptive management approach, the proponent must submit periodic revisions of the Stage 2 CSG WMMP for approval by the **Minister** in writing, who may seek the advice of an **expert panel**. Revisions must be submitted at least 3 months prior to planned **commencement** of each new **development stage** for the project. The revised CSG WMMP must take into account outcomes of the ongoing monitoring program in the Stage 2 CSG WMMP, groundwater model updates and any bioregional assessments.

23. If the **OGIA model** ceases to exist, then the **approval holder** must submit an alternate model to be used for the purpose of these conditions that replaces the **OGIA model** as referred to in these conditions. The alternate model must be approved by the **Minister** in writing before the next relevant stage of the CSG WMMP is submitted to the **Minister** for approval.

24. The **approval holder** must not **commence Stage 3** or **Stage 4** until a revised Stage 2 CSG WMMP is approved in writing by the **Minister** for that **development stage.** The approved revised Stage 2 CSG WMMP must be implemented.

25. The **Minister** may, by written request to the **approval holder**, require the Stage 1 or Stage 2 CSG WMMP to be revised, including to address expert advice. Any request must be acted on by the **approval holder** within the timeframe specified in the request.

Note 6: The Minister may throughout the life of the project life seek advice from experts, or an expert panel. As a consequence specific matters identified through such advice may need to be addressed in the CSG WMMP Plan. Where such advice is sought the approval holder would be provided with opportunity to submit information and respond to the specific matters identified, in order to ensure the CSG WMMP Plan is based on the best available information. Review requirements will facilitate adaptive management, align with Queensland Government approval requirements, and account for potential cumulative impacts as new scientific information becomes available over the life of the project.

General

26. Within 20 business days after the **commencement** of the action, the **approval holder** must advise the **Department** in writing of the actual date of **commencement.**

27. The **approval holder** must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plans, reports or strategies required by this approval, and make them available upon request to the **Department**. The annual report (condition 28) must state all confirmed cases of non-compliance along with details of any remedial actions. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act,** or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits may also be publicised through the general media.

28. Within three months of every 12 month anniversary of the **commencement** of the action, the **approval holder** must publish a report on its website for the life of the approval outlining how they have been compliant with the conditions of this approval over the previous 12 months, including implementation of any management plans as specified in the conditions. The **approval holder** must also report against disturbance limits. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published.

29. The **approval holder** must notify the **Department** in writing of potential non-compliance with any condition of this approval as soon as practical and within no later than ten business days of becoming aware of the potential non-compliance. The notice provided to the **Department** under this condition must specify:

    a) the condition which the **approval holder** has potentially breached;

    b) the nature of the potential non-compliance;

    c) when and how the **approval holder** became aware of the non-compliance;

    d) how the non-compliance will affect the approved action;

    e) how the non-compliance will affect the anticipated **impacts** of the approved action, in particular how the non-compliance will affect the **impacts** on the matters of national environmental significance;

    f) the measures the approval holder will take to address the **impacts** of the non-compliance on the matters of national environmental significance and rectify the non-compliance; and

    g) the time by when the approval holder will rectify the non-compliance.

30. Upon the direction of the **Minister**, the **approval holder** must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister.**

31. If the **approval holder** wishes to carry out any activity other than in accordance with the management plans as specified in the conditions, the **approval holder** must submit to the **Department** for the **Minister's** written approval a revised version of that management plan. The approval holder must not **commence** the varied activity until the **Minister** has approved the varied management plan. The **Minister** will not approve a varied management plan unless the revised management plan would result in an equivalent or improved environmental outcome over time. If the **Minister** approves the revised management plan, that management plan must be implemented in place of the management plan originally approved.

32. If the **Minister** believes that it is necessary or convenient for the better protection of listed threatened species, listed migratory species or water resources to do so, the **Minister**

may request that the **approval holder** make specified revisions to the management plans specified in the conditions and submit the revised management plan for the **Minister's** written approval. The **approval holder** must comply with any such request within the timeframe specified by the **Minister**. The revised approved management plan must be implemented. Unless the **Minister** has approved the revised management plan, then the person taking the action must continue to implement the management plan originally approved, as specified in the conditions.

33. If, at any time after five years from the date of this approval, the **approval holder** has not **commenced** the action, then the **approval holder** must not **commence** the action without the written agreement of the **Minister.**

34. Unless otherwise agreed to in writing by the **Minister**, the **approval holder** must publish all management plans referred to in these conditions of approval on their website. Each management plan must be published on the website within 1 month of being approved and remain available on that website for the life of the approval.

Definitions

Approval holder: means the person to whom the approval is granted.

Assessment Report: means the Queensland Department of Environment and Heritage Protection's report under the *Environmental Protection and Biodiversity Conservation Act 1994* for the action.

Commenced/commencement: means any physical disturbance, including clearance of native vegetation, new road work and the establishment of well sites to develop the gas field project area. Commencement does not include:

a) minor physical disturbance necessary to undertake pre-clearance surveys or establish monitoring programs or geotechnical investigations; or

b) activities that are critical to commencement that are associated with mobilisation of plant and equipment, materials, machinery and personnel prior to the start of development only if such activities will have no adverse impact on matters of national environmental significance, and only if the proponent has notified the Department in writing before an activity is undertaken.

Core habitat: means core habitat known and core habitat possible as defined in the rules for habitat mapping for each individual species in the *Supplementary Report to the Surat Gas Project EIS (March 2012), Attachment 1 – Matters of National Environmental Significance.*

Conservation advice: means an approved conservation advice under the EPBC Act for an EPBC Act listed species or community.

Core habitat known: means habitat where a spatially accurate confirmed record of a particular species exists (e.g. Herbrecs or survey record). Core habitat known is attributed to the particular habitat polygon in which it occurs, based on either regional ecosystem (RE) mapping provided by the Queensland Department of Environment and Heritage Protection (or successor agency) or high resolution habitat mapping developed for a specific purpose. Core habitat known also means a 1 km buffer around all spatially accurate (< 400 metres accuracy) species records.

Condamine Interconnectivity Research Project: means the Condamine Interconnectivity Research Project being undertaken by the Queensland Office of Groundwater Impact Assessment as part of the implementation of the Surat Underground Water Impact Report (UWIR), which was prepared by the Queensland Water Commission (QWC) in 2012.

Core habitat possible: means an area where previous records of a particular species are not known to occur within a given area or habitat, although specific habitat features are present which are known to be favoured by the species and the habitat occurs within the species known geographic range.

Department: means the Australian Government Department administering the *Environment Protection and Biodiversity Conservation Act 1999.*

Department's survey guidelines: means:
Matters of National Environmental Significance, Significant Impact Guidelines 1.1, Environment Protection and Biodiversity Conservation Act 1999 - http://www.environment.gov.au/epbc/publications/nes-guidelines.html.

Survey Guidelines for Australia's Threatened Frogs, Threatened Birds, Threatened Fish, Threatened Mammals, Threatened Reptiles and Threatened Bats: http://www.environment.gov.au/epbc/guidelines-policies.html.

Development stage: means Stage 1, Stage 2, Stage 3 or Stage 4 of project development, as defined in these definitions.

EPBC/ EPBC Act: means the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

EPBC Act Offsets Policy: means the *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy (October 2012) including the Offsets Assessment Guide.

EPBC community: means an endangered ecological community listed under the EPBC Act.

EPBC listed threatened species: means a threatened flora or fauna species listed under the EPBC Act.

Expert panel: means an expert panel appointed by the Minister.

Fitzroy River Turtle: means the Fitzroy River Turtle, *Rheodytes leukops*, listed as vulnerable under the EPBC Act.

General habitat: means where a species has not been recorded in a given location and habitat accounts for some of the features favoured by a particular species. The habitat occurs on the margins of a species known geographic range. Otherwise, the habitat is suitable for the species

Impact: has the definition assigned to it in section 527E of the EPBC Act.

Joint Industry Plan: means the *Joint Industry Plan for an Early Warning System for the Monitoring and Protection of EPBC Springs* established with other coal seam gas proponents operating within the Surat Cumulative Management Area.

Minister: means the Minister administering the *Environment Protection and Biodiversity Conservation Act 1999* and includes a delegate of the Minister.

Murray Cod: means the Murray Cod, *Maccullochella peelii*, listed as vulnerable under the EPBC Act.

OGIA: means the Office of Groundwater Impact Assessment or its successor body,

OGIA model: means the groundwater model developed by the Office of Groundwater Impact Assessment, or its successor body, for the Surat Cumulative Management Area.

Pre-clearance surveys: means surveys that are undertaken for EPBC species and EPBC communities for all areas of the project area that may be disturbed by project activities.

Project area: means the area identified as the project area in Attachment A.

Recovery plan: means an approved recovery plan under the EPBC Act for an EPBC listed species or EPBC community.

Stage 1: means year 1 to 3 (inclusive) of the action, starting at the date of commencement.

Stage 2: means year 4 to 11 (inclusive) of the action.

Stage 3: means year 12 to 20 (inclusive) of the action

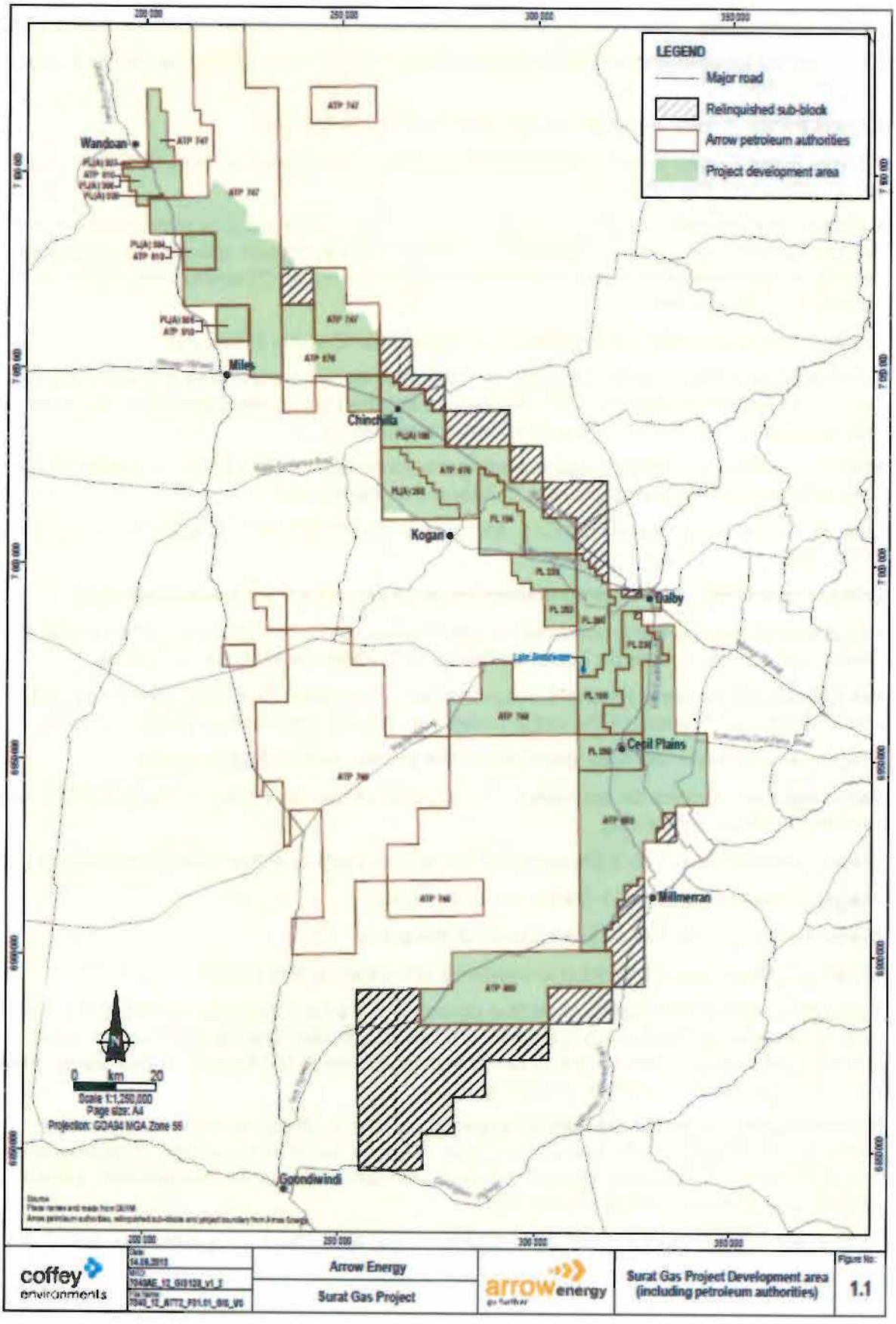
Stage 4: means year 21 to decommissioning (inclusive) of the action.

Suitably qualified ecologist: means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis to performance relative to the subject matter using relevant protocols, standards, methods and literature.

Suitably qualified water resources expert/s: means a natural person with at least a postgraduate degree (or equivalent) in a suitable area (such as hydrology or hydrogeology) and a minimum of 10 years relevant experience in water resources assessment, including at least one year of experience in Australia.

Threat abatement plan: means an approved threat abatement plan under the EPBC Act.

ATTACHMENT A



Appendix B

SGP South Environmental Authority (EA0001613)

Permit

Environmental Protection Act 1994

Environmental authority EA0001613

This DRAFT environmental authority is issued by the administering authority under Chapter 5 of the Environmental Protection Act 1994.

Environmental authority number: EA0001613

Environmental authority takes effect on 28 June 2022

Environmental authority holder(s)

Name(s)	Registered address
ARROW CSG (AUSTRALIA) PTY LTD	Level 39 111 Eagle Street BRISBANE CITY QLD 4000

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Ancillary 62 - Resource recovery and transfer facility operation - 1(c) - Operating a facility for receiving and sorting, dismantling, baling or temporarily storing category 2 regulated waste	PL1039
Schedule 3 - 06 - A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	PL1039
Schedule 3 - 03 - A petroleum activity that is likely to have a significant impact on a category A or B Environmentally Sensitive Area	PL1039
Schedule 3 - 08 - A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	PL1039
Schedule 3 - 06 - A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	PL1040

ABN 46 640 294 485

Environmentally relevant activity/activities	Location(s)
Schedule 3 - 03 - A petroleum activity that is likely to have a significant impact on a category A or B Environmentally Sensitive Area	PL1040
Ancillary 62 - Resource recovery and transfer facility operation - 1(c) - Operating a facility for receiving and sorting, dismantling, baling or temporarily storing category 2 regulated waste	PL1040
Schedule 3 - 08 - A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	PL1040
Schedule 3 - 03 - A petroleum activity that is likely to have a significant impact on a category A or B Environmentally Sensitive Area	PL1041
Schedule 3 - 08 - A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	PL1041
Ancillary 62 - Resource recovery and transfer facility operation - 1(c) - Operating a facility for receiving and sorting, dismantling, baling or temporarily storing category 2 regulated waste	PL1041
Schedule 3 - 06 - A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	PL1041
Schedule 3 - 03 - A petroleum activity that is likely to have a significant impact on a category A or B Environmentally Sensitive Area	PL1042
Ancillary 62 - Resource recovery and transfer facility operation - 1(c) - Operating a facility for receiving and sorting, dismantling, baling or temporarily storing category 2 regulated waste	PL1042
Schedule 3 - 06 - A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	PL1042
Schedule 3 - 08 - A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	PL1042

Environmentally relevant activity/activities	Location(s)
Schedule 3 - 06 - A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	PL1043
Ancillary 62 - Resource recovery and transfer facility operation - 1(c) - Operating a facility for receiving and sorting, dismantling, baling or temporarily storing category 2 regulated waste	PL1043
Schedule 3 - 03 - A petroleum activity that is likely to have a significant impact on a category A or B Environmentally Sensitive Area	PL1043
Schedule 3 - 08 - A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	PL1043
Schedule 3 - 08 - A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	PL185
Schedule 3 - 06 - A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	PL185
Schedule 3 - 03 - A petroleum activity that is likely to have a significant impact on a category A or B Environmentally Sensitive Area	PL185
Ancillary 62 - Resource recovery and transfer facility operation - 1(c) - Operating a facility for receiving and sorting, dismantling, baling or temporarily storing category 2 regulated waste	PL185
Schedule 3 - 06 - A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	PL493
Schedule 3 - 08 - A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	PL493
Schedule 3 - 03 - A petroleum activity that is likely to have a significant impact on a category A or B Environmentally Sensitive Area	PL493

Environmentally relevant activity/activities	Location(s)
Ancillary 62 - Resource recovery and transfer facility operation - 1(c) - Operating a facility for receiving and sorting, dismantling, baling or temporarily storing category 2 regulated waste	PL493

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority (EA) is issued is a restatement of the ERA as defined by legislation at the time the EA is issued. Where there is any inconsistency between that description of an ERA and the conditions stated by an EA as to the scale, intensity or manner of carrying out an ERA, the conditions prevail to the extent of the inconsistency.

An EA authorises the carrying out of an ERA and does not authorise any environmental harm unless a condition stated by the EA specifically authorises environmental harm.

A person carrying out an ERA must also be a registered suitable operator under the *Environmental Protection Act 1994* (EP Act).

Contaminated land

It is a requirement of the EP Act that an owner or occupier of contaminated land give written notice to the administering authority if they become aware of the following:

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or
- a change in the condition of the contaminated land (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the contaminated land (notice must be given within 20 business days)

that is causing, or is reasonably likely to cause, serious or material environmental harm.

For further information, including the form for giving written notice, refer to the Queensland Government website www.qld.gov.au, using the search term ‘duty to notify’.

Take effect

Please note that, in accordance with section 200 of the EP Act, an EA has effect:

a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority - on the nominated day; or

b) if the authority states a day or an event for it to take effect-on the stated day or when the stated event happens; or

c) otherwise on the day the authority is issued.

However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *Planning Act 2016* or an SDA Approval under the *State Development and Public Works Organisation Act 1971*), this EA will not take effect until the additional authorisation has taken effect.

If this EA takes effect when the additional authorisation takes effect, you must provide the administering authority written notice within 5 business days of receiving notification of the related additional authorisation taking effect.

The anniversary day of this environmental authority is the same day each year as the original take effect date unless you apply to change the anniversary day. The payment of the annual fee will be due each year on this day. An annual return will be due each year on 01 April.

If you have incorrectly claimed that an additional authorisation is not required, carrying out the ERA without the additional authorisation is not legal and could result in your prosecution for providing false or misleading information or operating without a valid environmental authority.

Signature

28 June 2022

Date

Rachel Copp
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:
Energy and Extractive Resources
GPO Box 2454, BRISBANE QLD 4001
Phone: (07) 3330 5715
Email: EnergyandExtractive@des.qld.gov.au

Privacy statement

Pursuant to section 540 of the EP Act, the Department is required to maintain a register of certain documents and information authorised under the EP Act. A copy of this document will be kept on the public register. The register is available for inspection by members of the public who are able take extracts, or copies of the documents from the register. Documents that are required to be kept on the register are published in their entirety, unless alteration is required by the EP Act. There is no general discretion allowing the Department to withhold documents or information required to be kept on the public register. For more information on the Department's public register, search 'public register' at www.qld.gov.au. For queries about privacy matters please email privacy@des.qld.gov.au or telephone 13 74 68.

Obligations under the *Environmental Protection Act 1994*

In addition to the requirements found in the conditions of this environmental authority, the holder must also meet their obligations under the EP Act, and the regulations made under the EP Act. For example, the holder must comply with the following provisions of the Act:

- general environmental duty (section 319)
- duty to notify environmental harm (section 320-320G)
- offence of causing serious or material environmental harm (sections 437-439)
- offence of causing environmental nuisance (section 440)
- offence of depositing prescribed water contaminants in waters and related matters (section 440ZG)
- offence to place contaminant where environmental harm or nuisance may be caused (section 443)

Other permits required

This permit only provides an approval under the *Environmental Protection Act 1994*. In order to lawfully operate you may also require permits / approvals from your local government authority, other business units within the department and other State Government agencies prior to commencing any activity at the site. For example, this may include permits / approvals with your local Council (for planning approval), the Department of Transport and Main Roads (to access state controlled roads), the Department of Resources (to clear vegetation), and the Department of Agriculture and Fisheries (to clear marine plants or to obtain a quarry material allocation).

Conditions of environmental authority

General conditions

Condition number	Condition
General 1	This environmental authority authorises the carrying out of the following resource activity(ies): (a) The petroleum activities[1] listed in **Schedule A, Table 1 – Authorised petroleum activities** to the extent they are carried out in accordance with the activity's corresponding scale and intensity (or both, where applicable); and (b) Essential petroleum activities that are not otherwise specified relevant activities.

Schedule A, Table 1 – Authorised petroleum activities

Activity(ies)	Location	Total scale of petroleum activities / infrastructure	Intensity / maximum size
Coal seam gas (CSG) production wells	PL 185	25 wells	1.1 ha per single well pad 1.9 ha per multi well pad
	PL 493	70 wells	
	PL 1039	215 wells	
	PL 1040	300 wells	
	PL 1041	15 wells	
	PL 1042	50 wells	
	PL 1043	40 wells	
	PL 185	25 km	535 km of pipeline

<table>
<tr><td></td><td>
<table>
<tr><td rowspan="6">Gas and water gathering pipelines</td><td>PL 493</td><td>95 km</td><td rowspan="6"></td></tr>
<tr><td>PL 1039</td><td>100 km</td></tr>
<tr><td>PL 1040</td><td>240 km</td></tr>
<tr><td>PL 1041</td><td>15 km</td></tr>
<tr><td>PL 1042</td><td>25 km</td></tr>
<tr><td>PL 1043</td><td>35 km</td></tr>
<tr><td>Regulated structures</td><td>PL 1041</td><td>1 dam
(Hillview Pilot Dam)</td><td>19.2 ha</td></tr>
</table>
[1]The petroleum activities are authorised petroleum activities for the purposes of the *Petroleum and Gas (production and Safety) Act 2004* and *the Petroleum Act 1923*.
</td></tr>
<tr><td>General 2</td><td>This environmental authority does not authorise environmental harm unless a condition contained in this environmental authority explicitly authorises that harm. Where there is no condition, the lack of a condition shall not be construed as authorising harm.</td></tr>
<tr><td>General 7</td><td>All monitoring must be undertaken by a suitably qualified person.</td></tr>
<tr><td>General 8</td><td>If requested by the administering authority in relation to investigating a complaint, monitoring must be commenced within 10 business days.</td></tr>
<tr><td>General 9</td><td>All laboratory analyses and tests must be undertaken by a laboratory that has NATA accreditation for such analyses and tests.</td></tr>
<tr><td>General 10</td><td>Notwithstanding condition (General 9), where there are no NATA accredited laboratories for a specific analyte or substance, then duplicate samples must be sent to at least two separate laboratories for independent testing or evaluation. Where two laboratories with accredited methodologies do not exist, blind duplicate samples may be sent to the same laboratory.</td></tr>
<tr><td>General 11</td><td>Monitoring and sampling must be carried out in accordance with the requirements of the following documents (as relevant to the sampling being undertaken), as amended from time to time:
(a) for waters and aquatic environments, the Queensland Government's Monitoring and Sampling Manual 2009 – *Environmental Protection (Water) Policy 2009*
(b) for groundwater, *Groundwater Sampling and Analysis – A Field Guide* (2009:27 GeoCat #6890.1)
(c) for noise, the Environmental Protection Regulation 2019
(d) for air, the *Queensland Air Quality Sampling Manual* and/or Australian Standard 4323.1:1995 *Stationary source emissions method 1: Selection of sampling positions*, as appropriate for the relevant measurement
(e) for soil, the *Guidelines for Surveying Soil and Land Resources, 2nd edition* (McKenzie *et al.* 2008), and/or the *Australian Soil and Land Survey Handbook, 3rd edition* (National Committee on Soil and Terrain, 2009)
(f) for dust, Australian Standard AS3580.</td></tr>
</table>

General 12	In addition to the requirements under Chapter 7, Part 1, Division 2 of the *Environmental Protection Act 1994*, the administering authority must be notified through the Pollution Hotline and in writing, as soon as possible, but within 48 hours of becoming aware of any of the following events: (a) any unauthorised significant disturbance to land (b) potential or actual loss of structural or hydraulic integrity of a dam (c) when the level of the contents of any regulated dam reaches the mandatory reporting level (d) when a regulated dam will not have available storage to meet the design storage allowance on 1 November of any year (e) likely or actual loss of well integrity (f) when the seepage trigger action response procedure required under condition (Water 14(g)) is or should be implemented (g) unauthorised releases of any volume of prescribed contaminants to waters (h) unauthorised releases of volumes of contaminants, in any mixture, to land greater than: i. 200 L of hydrocarbons; or ii. 1 000 L of brine; or iii. 5 000 L of untreated coal seam gas water; or iv. 5 000 L of raw sewage; or v. 10 000 L of treated sewage effluent. (i) monitoring results where two out of any five consecutive samples do not comply with the relevant limits in the environmental authority.
General 13	Petroleum activities that cause significant disturbance to land must not be carried out until financial assurance has been given to the administering authority as security for compliance with the environmental authority and any costs or expenses, or likely costs or expenses, mentioned in section 298 of the *Environmental Protection Act 1994*.
General 14	Prior to any changes in petroleum activities which would result in an increase to the maximum significant disturbance since financial assurance was last given to the administering authority, the holder of the environmental authority must amend the financial assurance and give the administering authority the increased amount of financial assurance.
General 15	If the amount of financial assurance held by the administering authority has been discounted and either the nominated period of financial assurance has ended, or an event or change in circumstance has resulted in the holder of the environmental authority no longer being able to meet one or more of the mandatory pre-requisites or applicable discount criteria, the holder of the environmental authority must amend the financial assurance and give the administering authority the increased amount of financial assurance as soon as practicable.

General 16	Petroleum activities involving significant disturbance to land cannot commence until the development of written contingency procedures for emergency environmental incidents which include, but are not necessarily limited to: (a) a clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity. (b) consideration of the risks caused by the petroleum activity including the impact of flooding and other natural events on the petroleum activity. (c) response procedures to be implemented to prevent or minimise the risks of environmental harm occurring. (d) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused. (e) procedures to investigate causes and impacts including impact monitoring programs for releases to waters and/or land. (f) training of staff to enable them to effectively respond. (g) procedures to notify the administering authority, local government and any potentially impacted landholder.
General 17	All plant and equipment must be maintained and operated in their proper and effective condition.
General 18	The following infrastructure must be signed with a unique reference name or number in such a way that it is clearly observable: (a) regulated dams and low consequence dams (b) exploration, appraisal and development wells (c) water treatment facilities (d) brine encapsulation facilities (e) landfill cells (f) sewage treatment facilities (g) specifically authorised discharge points to air and waters (h) any chemical storage facility associated with the environmentally relevant activity of chemical storage (i) field compressor stations (j) central compressor stations (k) gas processing facilities; and (l) pipeline compressor stations.
General 19	Measures to prevent fauna being harmed from entrapment must be implemented during the construction and operation of well infrastructure, dams and pipeline trenches.
General 20	For activities involving significant disturbance to land, control measures that are commensurate to the site-specific risk of erosion, and risk of sediment release to waters must be implemented to:

	(a) allow stormwater to pass through the site in a controlled manner and at non-erosive flow velocities (b) minimise soil erosion resulting from wind, rain, and flowing water (c) minimise the duration that disturbed soils are exposed to the erosive forces of wind, rain, and flowing water (d) minimise work-related soil erosion and sediment runoff; and (e) minimise negative impacts to land or properties adjacent to the activities (including roads).
General 21	Petroleum activities must not cause environmental nuisance at a sensitive place, other than where an alternative arrangement is in place.
General 22	A certification must be prepared by a suitably qualified person within 30 business days of completing every plan, procedure, program and report required to be developed under this environmental authority, which demonstrates that: (a) relevant material, including current published guidelines (where available) have been considered in the written document (b) the content of the written document is accurate and true; and (c) the document meets the requirements of the relevant conditions of the environmental authority.
General 23	All plans, procedures, programs, reports and methodologies required under this environmental authority must be written and implemented.
General 24	All documents required to be developed under this environmental authority must be kept for five years.
General 25	All documents required to be prepared, held or kept under this environmental authority must be provided to the administering authority upon written request within the requested timeframe.
General 26	A record of all complaints must be kept including the date, complainant's details, source, reason for the complaint, description of investigations and actions undertaken in resolving the complaint.

Waste conditions

Condition number	Condition
Waste 1	Measures must be implemented so that waste is managed in accordance with the waste and resource management hierarchy and the waste and resource management principles.
Waste 2	Waste, including waste fluids, but excluding waste used in closed-loop systems, must be transported off-site for lawful re-use, remediation, recycling or disposal, unless the waste is specifically authorised by conditions Waste 4, Waste 6, Waste 7, Waste 8, Waste 9 Waste 11, Waste 12, Waste 13 and Waste 16 to be disposed of or used on site.

Waste 3	Waste fluids, other than residual drilling material or drilling fluids stored in sumps, must be contained in either: (a) an above ground container; or (b) a structure which contains the wetting front.
Waste 4	Green waste may be used on-site for either rehabilitation or sediment and erosion control, or both.
Waste 6	Pipeline waste water, may be released to land provided that it: (a) can be demonstrated it meets the acceptable standards for release to land; and (b) is released in a way that does not result in visible scouring or erosion or pooling or run-off or vegetation die-off.
Waste 7	Produced water may be re-used in: (a) drilling and well hole activities.
Waste 8	Produced water may be used for dust suppression provided the following criteria are met: (a) the amount applied does not exceed the amount required to effectively suppress dust; and (b) the application: i. does not cause on-site ponding or runoff ii. is directly applied to the area being dust suppressed iii. does not harm vegetation surrounding the area being dust suppressed; and iv. does not cause visible salting.
Waste 9	Produced water may be used for construction purposes provided the use: (a) does not result in negative impacts on the composition and structure of soil or subsoils (b) is not directly or indirectly released to waters (c) does not result in runoff from the construction site; and (d) does not harm vegetation surrounding the construction site.
Waste 10	If there is any indication that any of the circumstances in condition (Waste 8)(b)(i) to (Waste 8(b)(iv)) or (Waste 9)(a) to (Waste 9(d)) is occurring the use must cease immediately and the affected area must be remediated without delay.
Waste 11	Treated sewage effluent or greywater can be released to land provided it: (a) meets or exceeds secondary treated class B standards for a treatment system with a daily peak design capacity of between 150 EP and 1500 EP; or (b) meets or exceeds secondary treated class C standards for a treatment system with a daily peak design capacity of less than 150 EP.
Waste 12	The release of treated sewage effluent or greywater authorised in condition (Waste 11) must:

	(a) be to a fenced and signed contaminant release area(s) (b) not result in pooling or run-off or aerosols or spray drift or vegetation die-off (c) be to a contaminant release area(s) that is kept vegetated with groundcover, that is: i. not a declared pest species ii. kept in a viable state for transpiration and nutrient uptake; and iii. grazed or harvested and removed from the contaminant release area as needed, but not less than every three months.
Waste 13	Notwithstanding condition (Waste 11), treated sewage effluent that meets or exceeds secondary treated class A standards may be used for dust suppression or construction activities, provided the use meets the criteria in condition (Waste 8) or (Waste 9), as relevant to the use.
Waste 15	If sumps are used to store residual drilling material or drilling fluids, they must only be used for the duration of drilling activities.
Waste 16	Residual drilling material may be disposed of on-site: (a) by mix-bury-cover method if the residual drilling material meets the approved quality criteria; or (b) if it is certified by a suitably qualified third party as being of acceptable quality for disposal to land by the proposed method and that environmental harm will not result from the proposed disposal.
Waste 17	Records must be kept to demonstrate compliance with condition (Waste 15) and (Waste 16).

Noise conditions

Condition number	Condition
Noise 1	Notwithstanding condition (General 21), emission of noise from the petroleum activity(ies) at levels less than those specified in **Protecting acoustic values, Table 1—Noise nuisance limits** are not considered to be environmental nuisance.

Protecting acoustic values, Table 1—Noise nuisance limits

Time period	Metric	Short term noise event	Medium term noise event	Long term noise event
7:00am—6:00pm	$L_{Aeq,adj,15\ min}$	45 dBA	43 dBA	40 dBA
6:00pm—10:00pm	$L_{Aeq,adj,15\ min}$	40 dBA	38 dBA	35 dBA
10:00pm—6:00am	$L_{Aeq,adj,15\ min}$	28 dBA	28 dBA	28 dBA
	Max $L_{pA,\ 15\ mins}$	55 dBA	55 dBA	55 dBA
6:00am—7:00am	$L_{Aeq,adj,15\ min}$	40 dBA	38 dBA	35 dBA

<table>
<tr><td></td><td>
<table>
<tr><td>Drilling activities undertaken from 10:00 pm – 7:00 am[2]</td><td>$L_{Aeq, adj, 15 min}$</td><td>28 (measured indoors)
33 (measured outdoors)</td></tr>
</table>
1. The noise limits in Table 1 have been set based on the following deemed background noise levels (L_{ABG})*:*
7:00am—6:00 pm: 35 dBA
6:00pm—10:00 pm: 30 dBA
10:00pm—6:00 am: 25 dBA
6:00am—7:00 am: 30 dBA
2. *Drilling activities undertaken from 10:00 pm – 7:00 am* must be temporary and mobile in nature, and must not contribute to long-term background noise creep.
</td></tr>
<tr><td>Noise 2</td><td>If the noise subject to a valid complaint is tonal or impulsive, the adjustments detailed in **Protecting acoustic values, Table 2—Adjustments to be added to noise levels at sensitive receptors** are to be added to the measured noise level(s) to derive $L_{Aeq, adj, 15 min}$.
Protecting acoustic values, Table 2—Adjustments to be added to noise levels at sensitive receptors
<table>
<tr><th>Noise characteristic</th><th>Adjustment to noise</th></tr>
<tr><td>Tonal characteristic is just audible</td><td>+ 2 dBA</td></tr>
<tr><td>Tonal characteristic is clearly audible</td><td>+ 5 dBA</td></tr>
<tr><td>Impulsive characteristic is just audible</td><td>+ 2 dBA</td></tr>
<tr><td>Impulsive characteristic is clearly audible</td><td>+ 5 dBA</td></tr>
</table>
</td></tr>
<tr><td>Noise 3</td><td>Notwithstanding condition (Noise 1), emission of any low frequency noise must not exceed either (Noise 3(a)) and (Noise 3(b)), or (Noise 3(c)) and (Noise 3(d)) in the event of a valid complaint about low frequency noise being made to the administering authority:
(a) 60 dB(C) measured outside the sensitive receptor; and
(b) the difference between the external A-weighted and C-weighted noise levels is no greater than 20 dB; or
(c) 50 dB(Z) measured inside the sensitive receptor; and
(d) the difference between the internal A-weighted and Z-weighted (Max $L_{pZ, 15 min}$) noise levels is no greater than 15 dB.</td></tr>
<tr><td colspan="2">Air conditions</td></tr>
<tr><td>Condition number</td><td>Condition</td></tr>
<tr><td>Air 1</td><td>Unless venting is authorised under the *Petroleum and Gas (Production and Safety) Act 2004* or the *Petroleum Act 1923*, waste gas must be flared in a manner that complies with all of (Air 1(a)) and (Air 1(b)) and (Air 1(c)), or with (Air 1(d)):
(a) an automatic ignition system is used, and
(b) a flame is visible at all times while the waste gas is being flared, and</td></tr>
</table>

	(c) there are no visible smoke emissions other than for a total period of no more than 5 minutes in any 2 hours, or (d) it uses an enclosed flare.

Land conditions	
Condition number	**Condition**
Land 1	Contaminants must not be directly or indirectly released to land except for those releases authorised by conditions Waste 4, Waste 6, Waste 7, Waste 8, Waste 9, Waste 11, Waste 12, Waste 13 and Waste 16.
Land 2	Top soil must be managed in a manner that preserves its biological and chemical properties.
Land 3	Land that has been significantly disturbed by the petroleum activities must be managed to ensure that mass movement, gully erosion, rill erosion, sheet erosion and tunnel erosion do not occur on that land.
Land 4	Acid sulfate soils must be treated and managed in accordance with the latest edition of the *Queensland Acid Sulfate Soil Technical Manual*.
Land 5	Chemicals and fuels stored, must be effectively contained and where relevant, meet Australian Standards, where such a standard is applicable.
Land 6	Pipeline operation and maintenance must be in accordance, to the greatest practicable extent, with the relevant section of the APIA Code of Environmental Practice: Onshore Pipelines (2013 or more recent editions).
Land 7	Pipeline trenches must be backfilled and topsoils reinstated within three months after pipe laying.
Land 8	Reinstatement and revegetation of the pipeline right of way must commence within 6 months after cessation of petroleum activities for the purpose of pipeline construction.
Land 9	Backfilled, reinstated and revegetated pipeline trenches and right of ways must be: (a) a stable landform (b) re-profiled to a level consistent with surrounding soils (c) re-profiled to original contours and established drainage lines; and (d) vegetated with groundcover which includes suitable species of vegetation for the location and not a pest species, and which is established and growing.

Biodiversity conditions	
Condition number	**Condition**
Biodiversity 1	Prior to undertaking activities that result in significant disturbance to land in areas of native vegetation, confirmation of on-the-ground biodiversity values of the native vegetation communities at that location must be undertaken by a suitably qualified person.
Biodiversity 2	A suitably qualified person must develop and certify a methodology so that condition (Biodiversity 1) can be complied with and which is appropriate to confirm on-the-ground biodiversity values.
Biodiversity 3	For conditions (Biodiversity 4) to (Biodiversity 9), where mapped biodiversity values differ from those confirmed under conditions (Biodiversity 1) and (Biodiversity 2), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground biodiversity value.
Biodiversity 4	The location of the petroleum activity(ies) must be selected in accordance with the following site planning principles: (a) maximise the use of areas of pre-existing disturbance (b) in order of preference, avoid, minimise or mitigate any impacts, including cumulative impacts, on areas of native vegetation or other areas of ecological value (c) minimise disturbance to land that may result in land degradation (d) in order of preference, avoid then minimise isolation, fragmentation, edge effects or dissection of tracts of native vegetation; and (e) in order of preference, avoid then minimise clearing of native mature trees.
Biodiversity 5	Linear infrastructure construction corridors must: (a) maximise co-location (b) be minimised in width to the greatest practicable extent; and (c) for linear infrastructure that is an essential petroleum activity authorised in an environmentally sensitive area or its protection zone, be no greater than 40m in total width.
Biodiversity 8	Where petroleum activities are to be carried out in environmentally sensitive areas or their protection zones, the petroleum activities must be carried out in accordance with **Protection of Biodiversity Values, Table 1—Authorised petroleum activities in environmentally sensitive areas and their protection zones**. **Protecting biodiversity values, Table 1—Authorised petroleum activities in environmentally sensitive areas and their protection zones**

Environmentally sensitive area	Within the environmentally sensitive area	Primary protection zone of the environmentally sensitive area	Secondary protection zone of the environmentally sensitive area
Category A environmentally sensitive areas	No petroleum activities permitted.	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.
Category B environmentally sensitive areas that are other than 'endangered' regional ecosystems	Only low impact petroleum activities permitted.	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.
Category B environmentally sensitive areas that are 'endangered' regional ecosystems	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.	Only essential petroleum activities permitted.
Category C environmentally sensitive areas that are 'nature refuges' or 'koala habitat'	Only low impact petroleum activities permitted.	Only low impact petroleum activities permitted.	
Category C environmentally sensitive areas that are 'essential habitat', 'essential regrowth habitat', or 'of concern' regional ecosystems	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.	
Category C environmentally sensitive areas that are 'regional parks' (previously known as 'resources reserves')	Only essential petroleum activities permitted.	Only essential petroleum activities permitted.	
Category C environmentally sensitive areas that are 'state forests' or 'timber reserves'	Only essential petroleum activities permitted.	Petroleum activities permitted.	

Biodiversity 8A

Despite condition (Biodiversity 8), the total scale and maximum footprint of significant disturbance specified in **Schedule F, Table 2 – Maximum significant disturbance** are authorised to be undertaken at the location and within the footprint prescribed in **Schedule F, Table 2 – Maximum significant disturbance.**

Protecting biodiversity values, Table 2 – Maximum significant disturbance

Activity(ies)	Location	Disturbance area	Maximum footprint
Ground disturbance within a Category B Environmentally Sensitive Area	PL 493	6 ha	17 ha
	PL 1039	11 ha	
	PL 185	0.5 ha	1,657 ha
	PL 493	5 ha	

<table>
<tr><td></td><td>
<table>
<tr><td rowspan="4">Ground disturbance within a Category C Environmentally Sensitive Area</td><td>PL 1039</td><td>10 ha</td><td rowspan="4"></td></tr>
<tr><td>PL 1040</td><td>1,640 ha</td></tr>
<tr><td>PL 1041</td><td>0.5 ha</td></tr>
<tr><td>PL 1043</td><td>1 ha</td></tr>
</table>
</td></tr>
<tr><td>Biodiversity 9</td><td>A report must be prepared for each annual return period for all petroleum activities that involved clearing of any environmentally sensitive area or protection zone which includes:
(a) records able to demonstrate compliance with conditions (Biodiversity 4), (Biodiversity 5) and (Biodiversity 8) and (Biodiversity 8A).
(b) a description of the works
(c) a description of the area and its pre-disturbance values (which may include maps or photographs, but must include GPS coordinates for the works); and
(d) based on the extent of environmentally sensitive areas and primary protection zones on the relevant resource authority(ies), the proportion of native vegetation cleared per environmentally sensitive area and primary protection zone, including regional ecosystem type, over the annual return period.</td></tr>
<tr><td>Biodiversity 10</td><td>Significant residual impacts to prescribed environmental matters are not authorised under this environmental authority or the Environmental Offsets Act 2014 unless the impact(s) is specified in Protecting biodiversity values, Table 3—Significant residual impacts to prescribed environmental matters.

Protecting biodiversity values, Table 3—Significant residual impacts to prescribed environmental matters
<table>
<tr><th>Prescribed environmental matter</th><th>Location of impact</th><th>Maximum extent of impact</th></tr>
<tr><td colspan="3">Regulated vegetation</td></tr>
<tr><td colspan="3">Endangered regional ecosystem</td></tr>
<tr><td>RE 11.3.1</td><td>PL 493</td><td>MNES</td></tr>
<tr><td>RE 11.3.21</td><td>PL 1039</td><td>12 ha</td></tr>
<tr><td>RE 11.4.3</td><td>PL 185, PL493</td><td>MNES</td></tr>
<tr><td>RE 11.4.12</td><td>PL 493</td><td>5 ha</td></tr>
<tr><td colspan="3">Of concern regional ecosystem (not within an urban area)</td></tr>
<tr><td>RE 11.3.2</td><td>PL 493,
PL 1039</td><td>1 ha</td></tr>
<tr><td>RE 11.3.4</td><td>PL 185
PL 493,
PL 1039</td><td>9 ha</td></tr>
<tr><td colspan="3">Regional ecosystems (not within an urban area) that intersect a wetland on the vegetation management wetlands map</td></tr>
<tr><td>RE 11.3.25</td><td>PL 1040</td><td>0.5 ha</td></tr>
<tr><td>RE 11.5.1</td><td>PL 1040</td><td>0.5 ha</td></tr>
<tr><td>RE 11.5.20</td><td>PL 1040</td><td>0.5 ha</td></tr>
</table>
</td></tr>
</table>

	Regional ecosystems (not within an urban area) within the defined distance from the defining banks of a relevant watercourse on the vegetation management watercourse map		
	RE 11.3.14 (BVG 18a)	PL 1040	0.5 ha
	RE 11.3.25 (BVG 16a)	PL 493 PL1039 PL1040 PL1043	18 ha
	RE 11.3.4 (BVG 16c)	PL 493 PL 1040	2 ha
	RE 11.4.3 (BVG 25a)	PL 493	1 ha
	RE 11.4.12 (BVG 17a)	PL 493	1 ha
	RE 11.5.1 (BVG 18b)	PL 493 PL1040	10 ha
	RE 11.5.4 (BVG 18b)	PL1040	5 ha
	RE 11.5.20 (BVG 13d)	PL 493 PL1040	11 ha
	RE 11.7.4 (BVG 12a)	PL 493 PL1040	2 ha
	RE 11.7.7 (BVG 12a)	PL 493	1 ha
	Essential habitat (not in an urban area) for endangered wildlife		
	Hemiaspis daemeli (Grey Snake)	PL1040	35 ha
	Essential habitat (not in an urban area) for vulnerable wildlife		
	Phascolarctos cinereus (Koala)	NA	MNES[1, 2]
	Connectivity areas		
	Connectivity area that is a regional ecosystem (not in urban area)		
	PL493	PL 493	3.4 ha
	PL1040	PL1040	10.5 ha
	Wetlands and watercourses		
	A wetland of high ecological significance shown on the Map of referable wetlands	PL 1039	0.5 ha
	Protected wildlife habitat		
	An area shown as a high risk area on the flora survey trigger map that contains plants that are endangered or vulnerable wildlife		
	Solanum papaverifolium	PL 1039	1 ha
	Habitat for an animal that is vulnerable wildlife		
	Acanthophis antarcticus (Death Adder)	PL1040	3.2ha
	Calyptorhynchus lathami (Glossy Black Cockatoo)	PL1040	3.2ha
	Furina dummali (Dunmall's Snake)	PL1040	MNES

	Nyctophilus corbeni (Corben's Long-eared Bat)	PL493 PL1040 PL185 PL1041 PL1043	MNES
	Habitat for an animal that is special least concern wildlife		
	Tachyglossus aculeatus (Short-beaked Echidna)	PL 493 PL1040	45.2 ha
	An area shown as a high-risk area on the flora survey trigger map that contains plants that are endangered or vulnerable wildlife		
	Fimbristylis vagans	PL1040	2.7ha
	Waterway providing for fish passage		
	Fish passage (not in an urban area) – Broadwater Gully, Kogan Creek, Eastern Branch Creek, Condamine River, Wilkie Creek, Jingi Jingi Creek, Cooranga Creek, Ashall Creek.	PL 185 PL 493 PL1039 PL 1040 PL 1041 PL1043 Total	4 ha 25 ha 9 ha 42 ha 1 ha 1 ha 82 ha
	[1] Matter(s) of National Environmental Significance (MNES) have been prescribed and will be offset in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Species Impact Management and Offset Plans, specifically the EPBC approval for the Surat Gas Project Environment Impact Statement (EPBC Approval 2010/5344, Tables 1 and 2). [2] No significant residual impacts to prescribed environmental matters are authorised under this environmental authority unless they are covered within EPBC Approval 2010/5344.		
Biodiversity 11	Records demonstrating that each impact to a prescribed environmental matter *not listed in* ***Protecting biodiversity values, Table 2—Significant residual impacts to prescribed environmental matters*** did not, or is not likely to, result in a significant residual impact to that matter must be: (a) completed by an appropriately qualified person; and (b) kept for the life of the environmental authority.		
Biodiversity 12	An environmental offset made in accordance with the *Environmental Offsets Act 2014* and Queensland Environmental Offsets Policy, as amended from time to time, must be undertaken for the maximum extent of impact to each prescribed environmental matter authorised in **Protecting biodiversity values, Table 3—Significant residual impacts to prescribed environmental matters**, unless a lesser extent of the impact has been approved in accordance with condition (Biodiversity 14).		

Biodiversity 13	The significant residual impacts to a prescribed environmental matter authorised in condition (Biodiversity 10) for which an environmental offset is required by condition (Biodiversity 12) may be carried out in stages. An environmental offset can be delivered for each stage of the impacts to prescribed environmental matters.
Biodiversity 14	Prior to the commencement of each stage, a report completed by an appropriately qualified person, that includes an analysis of the following must be provided to the administering authority: (a) for the forthcoming stage—the estimated significant residual impacts to each prescribed environmental matter; and (b) for the previous stage, if applicable—the actual significant residual impacts to each prescribed environmental matter, to date.
Biodiversity 15	The report required by condition (Biodiversity 14) must be approved by the administering authority before a notice of election for the forthcoming stage, if applicable, is given to the administering authority.
Biodiversity 16	A notice of election for the staged environmental offset referred to in condition (Biodiversity 15), if applicable, must be provided to the administering authority no less than three months before the proposed commencement of that stage, unless a lesser timeframe has been agreed to by the administering authority.
Biodiversity 17	Within six months from the completion of the final stage of the project, a report completed by an appropriately qualified person, that includes the following matters must be provided to the administering authority: (a) an analysis of the actual impacts on prescribed environmental matters resulting from the final stage; and (b) if applicable, a notice of election to address any outstanding offset debits for the authorised impacts.

Water conditions

Condition number	Condition
Water 1A	The extraction of groundwater as part of the petroleum activity(ies) from underground aquifers must not directly or indirectly influence the mobilisation of existing groundwater contamination on Lot 40 DY85, in such a way that increases the risk of harm to groundwater environmental values.
Water 1B	The environmental authority holder must not locate any coal seam gas production wells within 10 kilometres of the centre of Lot 40 DY85.
Water 1C	**Groundwater impact modelling** The administering authority may require the environmental authority holder to model the impacts of coal seam gas production activities on groundwater contamination around Lot 40 DY85 at any time and present the findings to the administering authority within 30 days from

<table>
<tr><td></td><td>the date of the request or a timeframe that has been agreed with the administering authority.</td></tr>
<tr><td>Water 1</td><td>Contaminants must not be directly or indirectly released to any waters.</td></tr>
<tr><td>Water 2</td><td>The extraction of groundwater as part of the petroleum activity(ies) from underground aquifers must not directly or indirectly cause environmental harm to a wetland.</td></tr>
<tr><td>Water 3</td><td>Petroleum activities must not occur in or within 200m of a:
(a) wetland of high ecological significance
(b) Great Artesian Basin Spring
(c) subterranean cave GDE.</td></tr>
<tr><td>Water 3A</td><td>Despite condition Water 3, the activities prescribed in Protecting Water values, Table 1, – Authorised disturbance in or within 200m of a wetland of high ecological significance, are authorised to be undertaken at the location and within the footprint prescribed.
Protecting water values, Table 1— Authorised disturbance in or within 200m of a wetland of high ecological significance
<table>
<tr><th>Activity</th><th>Location</th><th>Easting</th><th>Northing</th><th>Maximum footprint</th></tr>
<tr><td>Wells and gathering</td><td>PL 1039</td><td>151.29772°E</td><td>27.40571°S</td><td>0.5 ha</td></tr>
</table></td></tr>
<tr><td>Water 4</td><td>Only construction or maintenance of linear infrastructure is permitted in or within any wetland of other environmental value or in a watercourse.</td></tr>
<tr><td>Water 5A</td><td>The construction or maintenance of linear infrastructure in a wetland of other environmental value must not result in the:
(a) clearing of riparian vegetation outside of the minimum area practicable to carry out the works; or
(b) ingress of saline water into freshwater aquifers; or
(c) draining or filling of the wetland beyond the minimum area practicable to carry out the works.</td></tr>
<tr><td>Water 5B</td><td>After the construction or maintenance works for linear infrastructure in a wetland of other environmental value are completed, the linear infrastructure must not:
(a) drain or fill the wetland
(b) prohibit the flow of surface water in or out of the wetland
(c) lower or raise the water table and hydrostatic pressure outside the bounds of natural variability that existed before the activities commenced
(d) result in ongoing negative impacts to water quality
(e) result in bank instability; or
(f) result in fauna ceasing to use adjacent areas for habitat, feeding, roosting or nesting.</td></tr>
</table>

<table>
<tr><td>Water 6</td><td>The construction or maintenance of linear infrastructure activities in a watercourse must be conducted in the following preferential order:
(a) firstly, in times where there is no water present
(b) secondly, in times of no flow
(c) thirdly, in times of flow, providing a bankfull situation is not expected and that flow is maintained.</td></tr>
<tr><td>Water 7</td><td>The construction or maintenance of linear infrastructure authorised under condition (Water 4) must comply with the water quality limits as specified in Protecting water values, Table 2—Release limits for construction or maintenance of linear infrastructure.
Protecting water values, Table 2—Release limits for construction or maintenance of linear infrastructure
<table>
<tr><th>Water quality parameters</th><th>Units</th><th>Water quality limits</th></tr>
<tr><td rowspan="2">Turbidity</td><td rowspan="2">Nephelometric Turbidity Units (NTU)</td><td>For a wetland of other environmental value, if background water turbidity is above 45 NTU, no greater than 25% above background water turbidity measured within a 50m radius of the construction or maintenance activity.
For a watercourse, if background water turbidity is above 45 NTU, no greater than 25% above background water turbidity measured within 50m downstream of the construction or maintenance activity.</td></tr>
<tr><td>For a wetland of other environmental value, if background water turbidity is equal to, or below 45 NTU, a turbidity limit of no greater than 55 NTU applies, measured within a 50m radius of the construction or maintenance activity.
For a watercourse, if background water turbidity is equal to, or below 45 NTU, a turbidity limit of no greater than 55 NTU applies, measured within 50m downstream of the construction or maintenance activity.</td></tr>
<tr><td>Hydrocarbons</td><td>-</td><td>For a wetland of other environmental value, or watercourse, no visible sheen or slick</td></tr>
</table></td></tr>
<tr><td>Water 8</td><td>Monitoring must be undertaken at a frequency that is appropriate to demonstrate compliance with condition (Water 7).</td></tr>
<tr><td>Water 9</td><td>A register must be kept of all linear infrastructure construction and maintenance activities in a wetland of other environmental value and watercourses, which must include:
(a) location of the activity (e.g. GPS coordinates (GDA94) and watercourse name)
(b) estimated flow rate of surface water at the time of the activity
(c) duration of works, and
(d) results of impact monitoring carried out under condition (Water 8).</td></tr>
</table>

Water 10	Measures must be taken to minimise negative impacts to, or reversal of, any river improvement works carried out in River Improvement Areas by Queensland's River Improvement Trusts.
Water 11	Petroleum activity(ies) on floodplains must be carried out in a way that does not: (a) concentrate flood flows in a way that will or may cause or threaten a negative environmental impact; or (b) divert flood flows from natural drainage paths and alter flow distribution; or (c) increase the local duration of floods; or (d) increase the risk of detaining flood flows.
Water 12	A seepage monitoring program must be developed by a suitably qualified person which is commensurate with the site-specific risks of contaminant seepage from containment facilities, and which requires and plans for detection of any seepage of contaminants to groundwater as a result of storing contaminants within three months of the environmental authority taking effect.
Water 13	The seepage monitoring program required by condition (Water 12) must include but not necessarily be limited to: (a) identification of the containment facilities for which seepage will be monitored (b) identification of trigger parameters that are associated with the potential or actual contaminants held in the containment facilities (c) identification of trigger concentration levels that are suitable for early detection of contaminant releases at the containment facilities (d) installation of background seepage monitoring bores where groundwater quality will not have been affected by the petroleum activities authorised under this environmental authority to use as reference sites for determining impacts (e) installation of seepage monitoring bores that: i. are within formations potentially affected by the containment facilities authorised under this environmental authority (i.e. within the potential area of impact) ii. provide for the early detection of negative impacts prior to reaching groundwater dependent ecosystems, landholder's active groundwater bores, or water supply bores iii. provide for the early detection of negative impacts prior to reaching migration pathways to other formations (i.e. faults, areas of unconformities known to connect two or more formations) (f) monitoring of groundwater at each background and seepage monitoring bore for the trigger parameters identified in condition (Water 13(b)) at a frequency determined for each dam by a suitably qualified person and: i. at least once every two years where baseline data has been established; or ii. at least every six months for two years to establish baseline data for any impact to groundwaters, after which time, monitoring may continue at the frequency according to condition (Water 13(f)(i)).

	(g) seepage trigger action response procedures for when trigger parameters and trigger levels identified in conditions (Water 13(b)) and (Water 13(c)) trigger the early detection of seepage, or upon becoming aware of any monitoring results that indicate potential groundwater contamination (h) a rationale detailing the program conceptualisation including assumptions, determinations, monitoring equipment, sampling methods and data analysis; and (i) provides for annual updates to the program for new containment facilities constructed in each annual return period.
Water 14	A bore drill log must be completed for each seepage monitoring bore in condition (Water 13) which must include: (a) bore identification reference and geographical coordinate location (b) specific construction information including but not limited to depth of bore, depth and length of casing, depth and length of screening and bore sealing details (c) standing groundwater level and water quality parameters including physical parameter and results of laboratory analysis for the possible trigger parameters (d) lithological data, preferably a stratigraphic interpretation to identify the important features including the identification of any aquifers; and (e) target formation of the bore.

Rehabilitation conditions

Condition number	Condition
Rehabilitation 1	A Rehabilitation Plan must be developed by a suitably qualified person and must include the: (a) rehabilitation goals; and (b) procedures to be undertaken for rehabilitation that will: i. achieve the requirements of conditions (Rehabilitation 2) to (Rehabilitation 8), inclusive; and ii. provide for appropriate monitoring and maintenance.
Rehabilitation 2	Significantly disturbed areas that are no longer required for the on-going petroleum activities, must be rehabilitated within 12 months (unless an exceptional circumstance in the area to be rehabilitated (e.g. a flood event) prevents this timeframe being met) and be maintained to meet the following acceptance criteria: (a) contaminated land resulting from petroleum activities is remediated and rehabilitated (b) the areas are: i. non-polluting ii. a stable landform iii. re-profiled to contours consistent with the surrounding landform (c) surface drainage lines are re-established, consistent with natural flow patterns and self-sustaining

	(d) top soil is reinstated; and (e) either: i. groundcover, that is not a declared pest species, is growing; or ii. an alternative soil stabilisation methodology that achieves effective stabilisation is implemented and maintained.
Rehabilitation 3	All significantly disturbed areas caused by petroleum activities which are not being or intended to be utilised by the landholder or overlapping tenure holder, must be rehabilitated to meet the following final acceptance criteria measured either against the highest ecological value adjacent land use or the pre-disturbed land use: (a) greater than or equal to 70% of native ground cover species richness (b) greater than or equal to the total per cent of ground cover (c) less than or equal to the per cent species richness of declared plant pest species; and (d) where the adjacent land use contains, or the pre-clearing land use contained, one or more regional ecosystem(s), then at least one regional ecosystem(s) from the same broad vegetation group, and with the equivalent biodiversity status or a biodiversity status with a higher conservation value as any of the regional ecosystem(s) in either the adjacent land or pre-disturbed land, must be present.
Rehabilitation 4	Where significant disturbance to land has occurred in an environmentally sensitive area, the following final rehabilitation criteria as measured against the pre-disturbance biodiversity values assessment (required by conditions (Biodiversity 1) and (Biodiversity 2)) must be met: (a) greater than or equal to 70% of native ground cover species richness (b) greater than or equal to the total per cent ground cover (c) less than or equal to the per cent species richness of declared plant pest species (d) greater than or equal to 50% of organic litter cover (e) greater than or equal to 50% of total density of coarse woody material; and (f) all predominant species in the ecologically dominant layer, that define the pre-disturbance regional ecosystem(s) are present.
Rehabilitation 5	Conditions (Rehabilitation 2), (Rehabilitation 3) and (Rehabilitation 4) continue to apply after this environmental authority has ended or ceased to have effect.
Rehabilitation 8	Where there is a dam (including a low consequence dam) that is being or intended to be utilised by the landholder or overlapping tenure holder, the dam must be decommissioned to no longer accept inflow from the petroleum activity(ies) and the contained water must be of a quality suitable for the intended on-going uses(s) by the landholder or overlapping tenure holder.

Well construction, maintenance and stimulation activities conditions	
Condition number	**Condition**
Well activities 1	Oil based or synthetic based drilling muds must not be used in the carrying out of the petroleum activity(ies).
Well activities 2	Drilling activities must not result in the connection of the target gas producing formation and another aquifer.
Well activities 3	Practices and procedures must be in place to detect, as soon as practicable, any fractures that have or may result in the connection of a target formation and another aquifer as a result of drilling activities.
Well activities 4	Stimulation activities are not permitted.
Regulated Dam conditions	
Condition number	**Condition**
Dams 1	**Assessment of Consequence Category** The consequence category of any structure must be assessed by a suitably qualified and experienced person in accordance with the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933) at the following times: a) prior to the design and construction of the structure, if it is not an existing structure; or b) prior to any change in its purpose or the nature of its stored contents.
Dams 2	A consequence assessment report and certification must be prepared for each structure assessed and the report may include a consequence assessment for more than one structure.
Dams 3	Certification must be provided by the suitably qualified and experienced person who undertook the assessment, in the form set out in the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)*.
Dams 4	**Operation of a regulated structure** For existing structures that are regulated structures: a) where the existing structure that is a regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the DSA volume across the system, the holder must submit to the administering authority within 12 months of the commencement of this condition a copy of the certified system design plan including that structure; and b) there must be a current operational plan for the existing structures.

Dams 5	Each regulated structure must be maintained and operated, for the duration of its operational life until decommissioned and rehabilitated, in compliance with the current operational plan and, if applicable, the current design plan and associated certified 'as constructed' drawings.
Dam 6	**Mandatory reporting level** Conditions Dams 7 to Dams 8 inclusive only apply to Regulated Structures which have not been certified as low consequence category for 'failure to contain – overtopping'.
Dams 7	The Mandatory Reporting Level (the MRL) must be marked on a regulated dam in such a way that during routine inspections of that dam, it is clearly observable.
Dams 8	The holder must, as soon as practicable but within forty-eight (48) hours of becoming aware, notify the administering authority when the level of the contents of a regulated dam reaches the MRL.
Dams 9	The holder must, immediately on becoming aware that the MRL has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated dam.
Dams 10	The holder must record any changes to the MRL in the Register of Regulated Structures.
Dams 11	**Design storage allowance** The holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated dam or linked containment system taken prior to 1 July of each year.
Dams 12	By 1 November of each year, storage capacity must be available in each regulated dam (or network of linked containment systems with a shared DSA volume), to meet the Design Storage Allowance (DSA) volume for the dam (or network of linked containment systems).
Dams 13	The holder must, as soon as practicable but within forty-eight (48) hours of becoming aware that the regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority.
Dams 14	The holder must, immediately on becoming aware that a regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems.
Dams 15	**Annual inspection report** Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.
Dams 16	At each annual inspection, the condition and adequacy of all components of the regulated structure must be assessed and a suitably qualified and experienced person must prepare an annual inspection report containing details of the assessment and include a

	recommendations section, with any recommended actions to ensure the integrity of the regulated structure or a positive statement that no recommendations are required.
Dams 17	The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933).*
Dams 18	The holder must within 20 business days of receipt of the annual inspection report, provide to the administering authority: a) The recommendations section of the annual inspection report; and b) If applicable, any actions being taken in response to those recommendations; and c) If, following receipt of the recommendations and (if applicable) recommended actions, the administering authority requests a copy of the annual inspection report from the holder, provide this to the administering authority within 10 business days6 of receipt of the request.
Dams 19	**Transfer arrangements** The holder must provide a copy of any reports, documentation and certifications prepared under this authority, including but not limited to any Register of Regulated Structures, consequence assessment, design plan and other supporting documentation, to a new holder on transfer of this authority.
Dams 20	**Register of Regulated Structures** A Register of Regulated Structures must be established and maintained by the holder for each regulated structure.
Dams 21	The holder must provisionally enter the required information in the Register of Regulated Structures when a design plan for a regulated dam is submitted to the administering authority.
Dams 22	The holder must make a final entry of the required information in the Register of Regulated Structures once compliance with Dams 4 has been achieved.
Dams 23	The holder must ensure that the information contained in the Register of Regulated Structures is current and complete on any given day.
Dams 24	All entries in the Register of Regulated Structures must be approved by the chief executive officer for the holder of this authority, or their delegate, as being accurate and correct.
Dams 25	The holder must, at the same time as providing the annual return, supply to the administering authority a copy of the records contained in the Register of Regulated Structures, in the electronic format required by the administering authority.
Dams 26	**Transitional arrangements** All existing structures that have not been assessed in accordance with either the Manual or the former Manual for Assessing Hazard Categories and Hydraulic Performance of Dams must be assessed and certified in accordance with the Manual within 6 months of amendment of the authority adopting this schedule.
Dams 27	All existing structures must subsequently comply with the timetable for any further assessments in accordance with the Manual specified in Table 1 (Transitional hydraulic performance requirements for existing structures), depending on the consequence category for each existing structure assessed in the most recent previous certification for that structure.

Dams 28	Table 1 ceases to apply for a structure once any of the following events has occurred: a) it has been brought into compliance with the hydraulic performance criteria applicable to the structure under the Manual; or b) it has been decommissioned; or c) it has been certified as no longer being assessed as a regulated structure.

Dams 29

Certification of the transitional assessment required by Dams 26 and Dams 27 (as applicable) must be provided to the administering authority within 6 months of amendment of the authority adopting this schedule.

Regulated Dam conditions, Table 1 – Transitional hydraulic performance requirements for existing structures

Transition period required for existing structures to achieve the requirements of the *Manual for Assessing Consequence Categories and Hydraulic Performance of Dams*			
Compliance with criteria	**High consequence**	**Significant consequence**	**Low consequence**
>90% and a history of good compliance performance in last 5 years	No transition required	No transition required	No transitional conditions apply. Review consequence assessment every 7 years.
>70%-≤90%	Within 7 years, unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	Within 10 years, unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	No transitional conditions apply. Review consequence assessment every 7 years.
>50-≤70%	Within 5 years unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	Within 7 years unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	Review consequence assessment every 7 years.
≤50%	Within 5 years or as per compliance requirements (e.g. TEP timing).	Within 5 years or as per compliance requirements (e.g. TEP timing).	Review consequence assessment every 5 years.
Regulated levee designed to prevent the ingress of clean flood water <100% compliant[1]	Within 5 years unless otherwise agreed with the administering authority.		

[1] Levees designed for the diversion of contaminated waters or protection of the structural integrity of a dam are not to be considered as part of this provision. These levees are considered a key design element of the relevant dam and transitional periods should as such align to that relevant compliance criteria and consequence category.

1.1 *Definitions*

Key terms and/or phrases underlined in this environmental authority are defined in this section. Where a term is not defined, the definition in the *Environmental Protection Act 1994*, its regulations or environmental protection policies must be used. If a word remains undefined it has its ordinary meaning.

Term	Definition
acceptable standards for release to land	means wastewater of the following quality as determined by monitoring results or by characterisation: (a) electrical conductivity (EC) not exceeding 3000µS/cm (b) sodium adsorption ratio (SAR) not exceeding 8 (c) pH between 6.0 and 9.0 (d) heavy metals (measured as total) meets the respective short term trigger value in section 4.2.6, Table 4.2.10—Heavy metals and metalloids in Australian and New Zealand Guidelines for Fresh and Marine Water Quality (e) does not contain biocides.
acid sulfate soil(s)	means a soil or soil horizon which contains sulfides or an acid soil horizon affected by oxidation of sulfides.
adjacent land use(s)	means the ecosystem function adjacent to an area of significant disturbance, or where there is no ecosystem function, the use of the land. An adjacent land use does not include an adjacent area that shows evidence of edge effect.
administering authority	means: (a) for a matter, the administration and enforcement of which has been devolved to a local government under section 514 of the *Environmental Protection Act 1994*—the local government; or (b) for all other matters—the Chief Executive of the Department of Environment and Science; or (c) another State Government Department, Authority, Storage Operator, Board or Trust, whose role is to administer provisions under other enacted legislation.
alternative arrangement	means a written agreement about the way in which a particular environmental nuisance impact will be dealt with at a sensitive place, and may include an agreed period of time for which the arrangement is in place. An alternative arrangement may include, but is not limited to, a range of nuisance abatement measures to be installed at the sensitive place, or provision of alternative accommodation for the duration of the relevant nuisance impact.
analogue site(s)	means an area of land which contains values and characteristics representative of an area to be rehabilitated prior to disturbance. Such values must encompass land use, topographic, soil, vegetation, vegetation community attributes and other ecological characteristics. Analogue sites can be the pre-disturbed site of interest where significant surveying effort has been undertaken to establish benchmark parameters.
annual inspection report	means an assessment prepared by a suitably qualified and experienced person containing details of the assessment against the most recent consequence assessment report and design plan (or system design plan); (a) against recommendations contained in previous annual inspections reports; (b) against recognised dam safety deficiency indicators;

<table>
<tr><td></td><td>(c) for changes in circumstances potentially leading to a change in consequence category;
(d) for conformance with the conditions of this authority;
(e) for conformance with the ‘as constructed’ drawings;
(f) for the adequacy of the available storage in each regulated dam, based on an actual observation or observations taken after 31 May each year but prior to 1 November of that year, of accumulated sediment, state of the containment barrier and the level of liquids in the dam (or network of linked containment systems);
(g) for evidence of conformance with the current operational plan.</td></tr>
<tr><td>annual return period</td><td>means the most current 12-month period between two anniversary dates.</td></tr>
<tr><td>appraisal well</td><td>means a petroleum well to test the potential of one (1) or more natural underground reservoirs for producing or storing petroleum. For clarity, an appraisal well does not include an exploration well.</td></tr>
<tr><td>appropriately qualified person / suitably qualified person</td><td>means a person who has professional qualifications, training or skills or experience relevant to the nominated subject matters and can give authoritative assessment, advice and analysis about performance relevant to the subject matters using relevant protocols, standards, methods or literature.</td></tr>
<tr><td>approved quality criteria</td><td>for the purposes of residual drilling materials, means the residual drilling material meet the following quality standards:
<u>Part A</u> In all cases:<table><tr><th>Parameter</th><th>Maximum concentration</th></tr><tr><td>pH</td><td>6–10.5 (range)</td></tr><tr><td>Electrical Conductivity</td><td>20dS/m (20,000µS/cm)</td></tr><tr><td>Chloride*</td><td>8000mg/L</td></tr></table>*Chloride analysis is only required if an additive containing chloride was used in the drilling process
The limits in Part A must be measured in the clarified filtrate of oversaturated solids prior to mixing.
<u>Part B</u> If any of the following metals are a component of the drilling fluids, then for that metal:<table><tr><th>Parameter</th><th>Maximum concentration</th></tr><tr><td>Arsenic</td><td>20mg/kg</td></tr><tr><td>Selenium</td><td>5mg/kg</td></tr><tr><td>Boron</td><td>100mg/kg</td></tr><tr><td>Cadmium</td><td>3mg/kg</td></tr><tr><td>Chromium (total)</td><td>400mg/kg</td></tr><tr><td>Copper</td><td>100mg/kg</td></tr><tr><td>Lead</td><td>600mg/kg</td></tr></table>The limits in Part B and Part C refer to the post soil/by-product mix.</td></tr>
</table>

<table>
<tr><td></td><td>Part C If a hydrocarbon sheen is visible, the following hydrocarbon fractions:
<table>
<tr><th>TPH</th><th>Maximum concentration</th></tr>
<tr><td>C6-C10</td><td>170mg/kg</td></tr>
<tr><td>C10-C16</td><td>150mg/kg</td></tr>
<tr><td>C16-C34</td><td>1300mg/kg</td></tr>
<tr><td>C34-C40</td><td>5600mg/kg</td></tr>
<tr><td>Total Polycyclic Aromatic Hydrocarbons (PAHs)</td><td>20mg/kg</td></tr>
<tr><td>Phenols (halogenated)</td><td>1mg/kg</td></tr>
<tr><td>Phenols (non-halogenated)</td><td>60mg/kg</td></tr>
<tr><td>Monocyclic aromatic hydrocarbons
(Total sum of benzene, toluene, ethyl benzene, xylenes (includes ortho, para and meta xylenes) and styrene)</td><td>7mg/kg</td></tr>
<tr><td>Benzene</td><td>1mg/kg</td></tr>
</table></td></tr>
<tr><td>areas of pre-existing disturbance</td><td>means areas where environmental values have been negatively impacted as a result of anthropogenic activity and these impacts are still evident. Areas of pre-disturbance may include areas where legal clearing, logging, timber harvesting, or grazing activities have previously occurred, where high densities of weed or pest species are present which have inhibited re-colonisation of native regrowth, or where there is existing infrastructure (regardless of whether the infrastructure is associated with the authorised petroleum activities). The term ‘areas of pre-disturbance’ does not include areas that have been impacted by wildfire/s, controlled burning, flood or natural vegetation die-back.</td></tr>
<tr><td>assessed or assessment</td><td>by a suitably qualified and experienced person in relation to a consequence assessment of a dam, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit of the assessment:
(a) exactly what has been assessed and the precise nature of that determination;
(b) the relevant legislative, regulatory and technical criteria on which the assessment has been based;
(c) the relevant data and facts on which the assessment has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
(d) the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.</td></tr>
<tr><td>associated water</td><td>means underground water taken or interfered with, if the taking or interference happens during the course of, or results from, the carrying out of another authorised activity under a petroleum authority, such as a petroleum well, and includes waters also known as produced formation water. The term includes all contaminants suspended or dissolved within the water.</td></tr>
<tr><td>associated works</td><td>in relation to a dam, means:</td></tr>
</table>

	(a) operations of any kind and all things constructed, erected or installed for that dam; and (b) any land used for those operations.
Australian Standard 3580	means any of the following publications: • AS3580.10.1 Methods for sampling and analysis of ambient air—Determination of particulate matter—Deposited matter—Gravimetric method. • AS3580.9.6 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM10 high volume sampler with size-selective inlet—Gravimetric method • AS3580.9.9 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter— PM10 low volume sampler—Gravimetric sampler.
background noise level	means the sound pressure level, measured in the absence of the noise under investigation, as the $L_{A90,T}$ being the A-weighted sound pressure level exceeded for 90% of the measurement time period T of not less than 15 minutes (or $L_{A\ 90,\ adj,\ 15\ mins}$), using Fast response.
bankfull	means the channel flow rate that exists when the water is at the elevation of the channel bank above which water begins to spill out onto the floodplain. The term describes the condition of the channel relative to its banks (e.g. overbank, in-bank, bankfull, low banks, high bank).
bed	of any waters, has the meaning in Schedule 19, Part 2 of the Environmental Protection Regulation 2019 and— (a) includes an area covered, permanently or intermittently, by tidal or non-tidal waters; but (b) does not include land adjoining or adjacent to the bed that is from time to time covered by floodwater.
being or intended to be utilised by the landholder or overlapping tenure holder	for significantly disturbed land, means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder or the overlapping tenure holder has a preferred use of the land such that rehabilitation standards for revegetation by the holder of the environmental authority are not required. For dams, means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder or the overlapping tenure holder has a preferred use for the dam such that rehabilitation standards for revegetation by the holder of the environmental authority are not required.
biodiversity values	for the purposes of this environmental authority, means environmentally sensitive areas, prescribed environmental matters and wetlands.
BTEX	means benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene.
Category A Environmentally Sensitive Area	means any area listed in Schedule 19, Part 1, Section 1 of the Environmental Protection Regulation 2019.

Category B Environmentally Sensitive Area	means any area listed in Schedule 19, Part 1 Section 2 of the Environmental Protection Regulation 2019.
Category C Environmentally Sensitive Area	means any of the following areas: • nature refuges as defined in the conservation agreement for that refuge under the *Nature Conservation Act 1992* • koala habitat areas as defined under the Nature Conservation (Koala) Conservation Plan 2006 • state forests or timber reserves as defined under the *Forestry Act 1959* • regional parks (previously known as resource reserves) under the *Nature Conservation Act 1992* • an area validated as 'essential habitat' from ground-truthing surveys in accordance with the *Vegetation Management Act 1999* for a species of wildlife listed as endangered or vulnerable under the *Nature Conservation Act 1992* • *'*of concern regional ecosystems' that are remnant vegetation and identified in the database called 'RE description database' containing regional ecosystem numbers and descriptions.
certified or certification	in relation to any matter other than a design plan, 'as constructed' drawings or an annual report regarding dams means, a Statutory Declaration by a suitably qualified person or suitably qualified third party accompanying the written document stating: • the person's qualifications and experience relevant to the function • that the person has not knowingly included false, misleading or incomplete information in the document • that the person has not knowingly failed to reveal any relevant information or document to the administering authority • that the document addresses the relevant matters for the function and is factually correct; and • that the opinions expressed in the document are honestly and reasonably held.
certification	in relation to regulated dam conditions means assessment and approval must be undertaken by a suitably qualified and experienced person in relation to any assessment or documentation required by this Manual, including design plans, 'as constructed' drawings and specifications, construction, operation or an annual report regarding regulated structures, undertaken in accordance with the Board of Professional Engineers of Queensland Policy Certification by RPEQs (ID: 1.4 (2A)).
clearing	has the meaning in the dictionary of the *Vegetation Management Act 2000* and for vegetation— (a) means remove, cut down, ringbark, push over, poison or destroy in any way including by burning, flooding or draining; but (b) does not include destroying standing vegetation by stock, or lopping a tree.
closed-loop systems	means using waste on site in a way that does not release waste or contaminants in the waste to the environment.
consequence	in relation to a structure as defined, means the potential for environmental harm resulting from the collapse or failure of the structure to perform its primary purpose of containing, diverting or controlling flowable substances.

consequence category	means a category, either low, significant or high, into which a dam is assessed as a result of the application of tables and other criteria in the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933).
control measure	has the meaning in Chapter 4, Part 1 of the Environmental Protection Regulation 2019 and means a device, equipment, structure, or management strategy used to prevent or control the release of a contaminant or waste to the environment.
coal seam gas water	means underground water brought to the surface of the earth, or moved underground in connection with exploring for, or producing coal seam gas.
daily peak design capacity	for sewage treatment works, has the meaning in Schedule 2, section 63(4) of the Environmental Protection Regulation 2019 as the higher equivalent person (EP) for the works calculated using each of the formulae found in the definition for EP.
dam(s)	means a land-based structure or a void that contains, diverts or controls flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works.
designated precinct	has the meaning in Part 5 section 15(3) of the Regional Planning Interests Regulation 2014 and means: • for a strategic environmental area mentioned in section 4(1) – the area identified as a designated precinct on the strategic environmental area map for the strategic environmental are; or • if a strategic environmental area is shown on a map in a regional plan – the area identified on the map as a designated precinct for the strategic environmental area.
design storage allowance or DSA	means an available volume, estimated in accordance with the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)*, published by the administering authority, as amended from time to time, that must be provided in a dam to an annual exceedance probability specified in that Manual.
development wells	means a petroleum well which produces or stores petroleum. For clarity, a development well does not include an appraisal well.
document	has the meaning in the *Acts Interpretation Act 1954* and means: • any paper or other material on which there is writing; and • any paper or other material on which there are marks; and • figures, symbols or perforations having a meaning for a person qualified to interpret them; and • any disc, tape or other article or any material from which sounds, images, writings or messages are capable of being produced or reproduced (with or without the aid of another article or device).
ecologically dominant layer	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 5.1, March 2020) and means the layer making the greatest contribution to the overall biomass of the site and the vegetation community (NLWRA 2001). This is also referred to as the ecologically dominant stratum or the predominant canopy in woody ecosystems.
ecosystem function	means the interactions between and within living and nonliving components of an ecosystem and generally correlates with the size, shape and location of the vegetation community.

enclosed flare	means a device where the residual gas is burned in a cylindrical or rectilinear enclosure that includes a burning system and a damper where air for the combustion reaction is admitted.
environmental harm	has the meaning in section 14 of the *Environmental Protection Act 1994* and means any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance. Environmental harm may be caused by an activity— (a) whether the harm is a direct or indirect result of the activity; or (b) whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors.
environmental nuisance	has the meaning in section 15 of the *Environmental Protection Act 1994 and means* unreasonable interference or likely interference with an environmental value caused by— (a) aerosols, fumes, light, noise, odour, particles or smoke; or (b) an unhealthy, offensive or unsightly condition because of contamination; or (c) another way prescribed by regulation.
environmental offset	has the meaning in section 7 of the *Environmental Offsets Act 2014.*
environmentally sensitive area	means Category A, B or C environmentally sensitive areas (ESAs)
equivalent person or EP	has the meaning under section 3 of the Planning Guidelines For Water Supply and Sewerage, 2005, published by the Queensland Government. It is calculated in accordance with Schedule 2, Section 63(4) of the Environmental Protection Regulation 2019 where: • EP = V/200 where V is the volume, in litres, of the average dry weather flow of sewage that can be treated at the works in a day; or • EP = M/2.5 where M is the mass, in grams, of phosphorus in the influent that the works are designed to treat as the inlet load in a day.
essential petroleum activities	means activities that are essential to bringing the resource to the surface and are only the following: • low impact petroleum activities • geophysical, geotechnical, geological, topographic and cadastral surveys (including seismic, sample /test / geotechnical pits, core holes) • single well sites not exceeding 1 hectare disturbance and multi-well sites not exceeding 1.5 hectare disturbance • well sites with monitoring equipment (including monitoring bores): o for single well sites, not exceeding 1.25 hectares disturbance o for multi-well sites, not exceeding 1.75 hectares disturbance • well sites with monitoring equipment (including monitoring bores) and tanks (minimum 1 ML) for above ground fluid storage: o for single well sites, not exceeding 1.5 hectares disturbance

	o for multi-well sites, not exceeding 2.0 hectares disturbance • associated infrastructure located on a well site necessary for the construction and operations of wells: o water pumps and generators o flare pits o chemical / fuel storages o sumps for residual drilling material and drilling fluids o tanks, or dams which are not significant or high consequence dams to contain wastewater (e.g. stimulation flow back waters, produced water) o pipe laydown areas o soil and vegetation stockpile areas o a temporary camp associated with a drilling rig that may involve sewage treatment works that are no release works o temporary administration sites and warehouses o dust suppression activities using water that meets the quality and operational standards approved under the environmental authority • communication and power lines that are necessary for the undertaking of petroleum activities and that are located within well sites, well pads and pipeline right of ways without increasing the disturbance area of petroleum activities • supporting access tracks • gathering / flow pipelines from a well head to the initial compression facility • activities necessary to achieve compliance with the conditions of the environmental authority in relation to another essential petroleum activity (e.g. sediment and erosion control measures, rehabilitation, on-site disposal of residual drilling material).
existing authority	has the meaning in section 94 of the *Environmental Offsets Act 2014*.
exploration well	means a petroleum well that is drilled to: • explore for the presence of petroleum or natural underground reservoirs suitable for storing petroleum; or • obtain stratigraphic information for the purpose of exploring for petroleum. For clarity, an exploration well does not include an appraisal or development well.
flare pit	has the meaning in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635), and means containment area where any hydrocarbon that is discovered in an over-pressured reservoir during a drilling operation is diverted to, and combusted, The flare pit is only used during the drilling and work over process on a petroleum well.
flare precipitant	means waste fluids which result from the operation of a flare.
floodplains	has the meaning in the *Water Act 2000* and means an area of reasonably flat land adjacent to a watercourse that— • is covered from time to time by floodwater overflowing from the watercourse; and • does not, other than in an upper valley reach, confine floodwater to generally

	follow the path of the watercourse; and • has finer sediment deposits than the sediment deposits of any bench, bar or in-stream island of the watercourse.
flowable substance	means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids fluids or solids either in solution or suspension.
fuel burning or combustion facility	means a permanent fuel burning or combustion equipment which in isolation, or combined in operation, or which are interconnected, is, or are capable of burning more than 500 kg of fuel in an hour.
GDA	means Geocentric Datum of Australia.
Great Artesian Basin (GAB) spring	means an area protected under the *Environment Protection and Biodiversity Conservation Act 1999* because it is considered to be a Matter of National Environmental Significance and identified as a: • community of native species dependent on natural discharge of groundwater from the Great Artesian Basin; or • Great Artesian Basin spring; or • Great Artesian Basin discharge spring wetland. A GAB spring includes a spring vent, spring complex or watercourse spring and includes the land to which water rises naturally from below the ground and the land over which the water then flows. *Note: The Australian Government's Protected Matters Search Tool should be used to get an indication of whether the area of interest may contain an MNES spring.* *Note: The GAB springs dataset can be requested from the Queensland Government Herbarium*
green waste	means waste that is grass cuttings, trees, bushes, shrubs, material lopped from trees, untreated timber or other waste that is similar in nature but does not include declared pest species.
greywater	means wastewater generated from domestic activities such as laundry, dishwashing, and bathing. Greywater does not include sewage.
groundwater dependent ecosystem (GDE)	means ecosystems which require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants and animals, ecological processes and ecosystem services. For the purposes of the environmental authority, groundwater dependent ecosystems do not include those mapped as "unknown".
growing	means to increase by natural development, as any living organism or part thereof by assimilation of nutriment; increase in size or substance.
holder	means: (a) where this document is an environmental authority, any person who is the holder of, or is acting under, that environmental authority; or (b) where this document is a development approval, any person who is the registered operator for that development approval.

hydraulic integrity	refers to the capacity of a dam to contain or safely pass flowable substances based on its design.
impulsive (for noise)	means sound characterised by brief excursions of sound pressure (acoustic impulses) that significantly exceed the background sound pressure. The duration of a single impulsive sound is usually less than one second.
$L_{A\ 90,\ adj,\ 15\ mins}$	means the A-weighted sound pressure level, adjusted for tonal character that is equal to or exceeded for 90% of any 15 minutes sample period equal, using Fast response.
$L_{Aeq,\ adj,\ 15\ mins}$	means the A-weighted sound pressure level of a continuous steady sound, adjusted for tonal character, that within any 15 minute period has the same square sound pressure as a sound level that varies with time.
land degradation	has the meaning in the *Vegetation Management Act 1999* and means the following: • soil erosion • rising water tables • the expression of salinity • mass movement by gravity of soil or rock • stream bank instability • a process that results in declining water quality.
landholder's active groundwater bore	means bores that are able to continue to provide a reasonable yield of water in terms of quantity for the bores authorised purpose or use. This term does not include monitoring bores owned by the administering authority of the *Water Act 2000*.
linear infrastructure	means powerlines, pipelines, flowlines, roads and access tracks.
liquid	means a substance which is flowing and offers no permanent resistance to changes of shape.
long term noise event	means a noise exposure, when perceived at a sensitive receptor, persists for a period of greater than five (5) days, even when there are respite periods when the noise is inaudible within those five (5) days.
low consequence dam	means any dam that is not classified as high or significant as assessed using the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, published by the administering authority, as amended from time to time.
low impact petroleum activities	means petroleum activities which do not result in the clearing of native vegetation, cause disruption to soil profiles through earthworks or excavation or result in significant disturbance to land which cannot be rehabilitated immediately using hand tools after the activity is completed. Examples of such activities include but are not necessarily limited to soil surveys (excluding test pits), topographic surveys, cadastral surveys and ecological surveys, may include installation of monitoring equipment provided that it is within the meaning of low impact and traversing land by car or foot via existing access tracks or routes or in such a way that does not result in permanent damage to vegetation.

mandatory reporting level or MRL	means a warning and reporting level determined in accordance with the criteria in the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)* published by the administering authority.
Map of referable wetlands	has the meaning in Schedule 12 of the Environmental Protection Regulation 2008 and means the 'Map of referable wetlands', a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D.
Max $L_{pA, 15\ min}$	means the absolute maximum instantaneous A-weighted sound pressure level, measured over 15 minutes.
Max $L_{pZ, 15\ min}$	means the maximum value of the Z-weighted sound pressure level measured over 15 minutes.
maximum extent of impact	means the total, cumulative, residual extent and duration of impact to a prescribed environmental matter that will occur over a project's life after all reasonable avoidance and reasonable on-site mitigation measures have been, or will be, undertaken.
medium term noise event	is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than five (5) days and does not re-occur for a period of at least four (4) weeks. Re-occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a difference source or source location.
methodology	means the science of method, especially dealing with the logical principles underlying the organisation of the various special sciences, and the conduct of scientific inquiry.
mix-bury-cover method	means the stabilisation of residual drilling solids in the bottom of a sump by mixing with subsoil and which occurs in accordance with the following methodology: • the base of the subsoil and residual solid mixture must be separated from the groundwater table by at least one metre of a continuous layer of impermeable subsoil material (kw=10–8m/s) or subsoil with a clay content of greater than 20%; and • the residual solids is mixed with subsoil in the sump and cover; and • the subsoil and residual solids is mixed at least three parts subsoil to one part waste (v/v); and • a minimum of one metre of clean subsoil must be placed over the subsoil and residual solids mixture; and • topsoil is replaced.
month	has the meaning in the *Acts Interpretation Act 1954* and means a calendar month and is a period starting at the beginning of any day of one (1) of the 12 named months and ending— • immediately before the beginning of the corresponding day of the next named month; or • if there is no such corresponding day—at the end of the next named month.
NATA accreditation	means accreditation by the National Association of Testing Authorities Australia.
notice of election	has the meaning in section 18(2) *Environmental Offsets Act 2014*.

prescribed environmental matters	has the meaning in section 10 of the *Environmental Offsets Act 2014*, limited to the matters of State environmental significant listed in schedule 2 of the Environmental Offsets Regulation 2014.
pipeline waste water	means hydrostatic testing water, flush water or water from low point drains.
pre-disturbed land use	means the function or use of the land as documented prior to significant disturbance occurring at that location.
predominant species	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) and means a species that contributes most to the overall above-ground biomass of a particular stratum.
prescribed contaminants	has the meaning in section 440ZD of the *Environmental Protection Act 1994* and means:
primary protection zone	means an area within 200m from the boundary of any Category A, B or C ESA.
produced water	has the meaning in Section 15A of the *Petroleum and Gas (Production and Safety) Act 2004* and means CSG water or associated water for a petroleum tenure.
protection zone	means the primary protection zone of any Category A, B or C ESA or the secondary protection zone of any Category A or B ESA.
regional ecosystem	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 4.0 May 2017) and means a vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform and soil. Regional ecosystems of Queensland were originally described in Sattler and Williams (1999). The Regional Ecosystem Description Database (Queensland Herbarium 2013) is maintained by Queensland Herbarium and contains the current descriptions of regional ecosystems.
register of regulated structures	includes: (a) Date of entry in the register; (b) Name of the structure, its purpose and intended/actual contents; (c) The consequence category of the dam as assessed using the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933); (d) Dates, names, and reference for the design plan plus dates, names, and reference numbers of all document(s) lodged as part of a design plan for the dam; (e) Name and qualifications of the suitably qualified and experienced person who certified the design plan and 'as constructed' drawings; (f) For the regulated dam, other than in relation to any levees – i. The dimensions (metres) and surface area (hectares) of the dam measured at the footprint of the dam; ii. Coordinates (latitude and longitude in GDA94) within five metres at any point from the outside of the dam including its storage area iii. Dam crest volume (megalitres); iv. Spillway crest level (metres AHD). v. Maximum operating level (metres AHD); vi. Storage rating table of stored volume versus level (metres AHD); vii. Design storage allowance (megalitres) and associated level of the dam (metres AHD);

	viii. Mandatory reporting level (metres AHD); (g) The design plan title and reference relevant to the dam; (h) The date construction was certified as compliant with the design plan; (i) The name and details of the suitably qualified and experienced person who certified that the constructed dam was compliant with the design plan; (j) Details of the composition and construction of any liner; (k) The system for the detection of any leakage through the floor and sides of the dam; (l) Dates when the regulated dam underwent an annual inspection for structural and operational adequacy, and to ascertain the available storage volume for 1 November of any year; (m) Dates when recommendations and actions arising from the annual inspection were provided to the administering authority; (n) Dam water quality as obtained from any monitoring required under this authority as at 1 November of each year.
regulated dam	means any dam in the significant or high consequence category as assessed using the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635), published by the administering authority, as amended from time to time.
regulated structure	means any structure in the significant or high consequence category as assessed using the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933) published by the administering authority. A regulated structure does not include: • a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container; • a sump or earthen pit used to store residual drilling material and drilling fluid only for the duration of drilling and well completion activities • a flare pit.
rehabilitation or rehabilitated	means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with acceptance criteria and, where relevant, includes remediation of contaminated land. For the purposes of pipeline rehabilitation, rehabilitation includes reinstatement, revegetation and restoration.
reinstate or reinstatement	for pipelines, means the process of bulk earth works and structural replacement of pre-existing conditions of a site (i.e. soil surface typography, watercourses, culverts, fences and gates and other landscape(d) features) and is detailed in the Australian Pipeline Industry Association (APIA) Code of Environmental Practice: Onshore Pipelines (2013).
reporting limit	means the lowest concentration that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes, the reporting limit is selected as the lowest non-zero standard in the calibration curve. Results that fall below the reporting limit will be reported as “less than” the value of the reporting limit. The reporting limit is also referred to as the practical quantitation limit or the limit of quantitation. For polycyclic aromatic hydrocarbons, the reporting limit must be based on super-ultra trace methods and, depending on the specific polycyclic aromatic hydrocarbon, will range between 0.005 ug/L–0.02 ug/L.
residual drilling material	means waste drilling materials including muds and cuttings or cement returns from well holes and which have been left behind after the drilling fluids are pumped out.
restoration	means the replacement of structural habitat complexity, ecosystem processes, services and function from a disturbed or degraded site to that of a pre-determined or analogue

	site. For the purposes of pipelines, restoration applies to final rehabilitation after pipeline decommissioning.
restricted stimulation fluids	has the meaning in section 206 of the *Environmental Protection Act 1994* and means fluids used for the purpose of stimulation, including fracturing, that contain the following chemicals in more than the maximum amount prescribed under a regulation— (a) petroleum hydrocarbons containing benzene, ethylbenzene, toluene or xylene (b) chemicals that produce, or are likely to produce, benzene, ethylbenzene, toluene or xylene as the chemical breaks down in the environment.
revegetation or revegetating or revegetate	means to actively re-establish vegetation through seeding or planting techniques in accordance with site specific management plans.
secondary protection zone	in relation to a Category A or Category B ESA means an area within 100 metres from the boundary of the primary protection zone.
secondary treated class A standards	means treated sewage effluent or greywater which meets the following standards: • total phosphorous as P, maximum 20mg/L • total nitrogen as N, maximum 30mg/L • 5-day biochemical oxygen demand (inhibited) (e.g. release pipe from sewage treatment plant), maximum 20mg/L • suspended solids, maximum 30mg/L • pH, range 6.0 to 8.5 e-coli, 80th percentile based on at least 5 samples with not less than 30 minutes between samples, 100cfu per 100mL, maximum 1000cfu per 100mL.
secondary treated class B standards	means treated sewage effluent or greywater which meets the following standards: • total phosphorous as P, maximum 20mg/L • total nitrogen as N, maximum 30mg/L • 5-day biochemical oxygen demand (inhibited) (e.g. release pipe from sewage treatment plant), maximum 20mg/L • suspended solids, maximum 30mg/L • pH, range 6.0 to 8.5 e-coli, 80th percentile based on at least 5 samples with not less than 30 minutes between samples, 1000cfu per 100mL, maximum 10 000cfu per 100mL.
secondary treated class C standards	means treated sewage effluent or greywater which meets the following standards: • total phosphorous as P, maximum 20mg/L • total nitrogen as N, maximum 30mg/L • 5-day biochemical oxygen demand (inhibited) (e.g. Release pipe from sewage treatment plant), maximum 20mg/L • suspended solids, maximum 30mg/L • pH, range 6.0 to 8.5 e-Coli, 80th percentile based on at least 5 samples with not less than 30 minutes between samples, 10 000cfu per 100mL, maximum 100 000cfu per 100mL.

sensitive place	means: • a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel) • a library, childcare centre, kindergarten, school, university or other educational institution • a medical centre, surgery or hospital • a protected area • a public park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment • a work place used as an office or for business or commercial purposes, which is not part of the petroleum activity(ies) and does not include employees accommodation or public roads • for noise, a place defined as a sensitive receptor for the purposes of the Environmental Protection (Noise) Policy 2008.
sensitive receptor	is defined in Schedule 2 of the Environmental Protection (Noise) Policy 2008, and means an area or place where noise is measured.
short term noise event	is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than eight hours and does not re-occur for a period of at least seven (7) days. Re-occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a different source or source location.
significant residual impact	has the meaning in section 8 *Environmental Offsets Act 2014*.
significantly disturbed or significant disturbance or significant disturbance to land or areas	has the meaning in Schedule 12, section 4 of the Environmental Protection Regulation 2008. Land is significantly disturbed if— (i) to a condition required under the relevant environmental authority; or (ii) if the environmental authority does not require the land to be rehabilitated to a particular condition—to the condition it was in immediately before the disturbance.
species richness	means the number of different species in a given area.
stable	has the meaning in Schedule 8 of the Environmental Protection Regulation 2019 and, for a site, means the rehabilitation and restoration of the site is enduring or permanent so that the site is unlikely to collapse, erode or subside.
statement of compliance	for a condition in an environmental authority has the meaning in section 208 of the *Environmental Protection Act 1994* and is a condition that requires the holder to give the administering authority a statement of compliance about a document or work relating to a relevant activity. The condition must also state— (a) the criteria (the compliance criteria) the document or work must comply with; and (b) that the statement of compliance must state whether the document or work complies with the compliance criteria; and (c) the information (the supporting information) that must be provided to the administering authority to demonstrate compliance with the compliance criteria; and (d) when the statement of compliance and supporting information must be given to the

	administering authority.
stimulation	means a technique used to increase the permeability of natural underground reservoir that is undertaken above the formation pressure and involves the addition of chemicals. It includes hydraulic fracturing / hydrofraccing, fracture acidizing and the use of proppant treatments. **Explanatory note:** This definition is restricted from that in the *Petroleum and Gas (Production and Safety) Act 2004* in order to only capture the types of stimulation activities that pose a risk to environmental values of water quality in aquifers.
strategic environmental area	has the meaning in section 11(1) of the *Regional Planning Interest Act 2014.*
structure	means a dam or levee.
subterranean cave GDE	• means an area identified as a subterranean cave in the mapping produced by the Queensland Government and identified in the Queensland Government Information System, as amended from time to time; and • means a cave ecosystem which requires access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain its communities of plants and animals, ecological processes and ecosystem services. Subterranean cave GDEs are caves dependent on the subterranean presence of groundwater. Subterranean cave GDEs have some degree of groundwater connectivity and are indicated by either high moisture levels or the presence of stygofauna, or both, referred to in the Queensland Government WetlandsInfo mapping program, as amended from time to time. *Note: the Subterranean GDE (caves) dataset can be displayed through the Queensland Government WetlandInfo mapping program.* *Note: the Subterranean GDE (caves) dataset can be obtained from the Queensland Government Information System.*
suitably qualified third party	means a person who: (a) has qualifications and experience relevant to performing the function including but not limited to: i. a bachelor's degree in science or engineering; and ii. 3 years' experience in undertaking soil contamination assessments; and (b) is a member of at least one organisation prescribed in Schedule 14 of the Environmental Protection Regulation 2019; and (c) not be an employee of, nor have a financial interest or any involvement which would lead to a conflict of interest with the holder(s) of the environmental authority.
sump	means a pit in which waste residual drilling material or drilling fluids are stored only for the duration of drilling activities.
synthetic based drilling mud	means a mud where the base fluid is a synthetic oil, consisting of chemical compounds which are artificially made or synthesised by chemically modifying petroleum components or other raw materials rather than the whole crude oil.
system design plan	means a plan that manages an integrated containment system that shares the required DSA and/or ESS volume across the integrated containment system.

top soil	means the surface (top) layer of a soil profile, which is more fertile, darker in colour, better structured and supports greater biological activity than underlying layers. The surface layer may vary in depth depending on soil forming factors, including parent material, location and slope, but generally is not greater than about 300mm in depth from the natural surface.
total density of coarse woody material	means the total length of logs on the ground greater than or equal to 10cm diameter per hectare and number of logs on the ground greater than or equal to 10cm diameter per hectare.
transmissivity	means the rate of flow of water through a vertical strip of aquifer which is one unit wide and which extends the full saturated depth of the aquifer.
valid complaint	means all complaints unless considered by the administering authority to be frivolous, vexatious or based on mistaken belief.
void	means any constructed, open excavation in the ground.
waste and resource management hierarchy	has the meaning provided in section 9 of the *Waste Reduction and Recycling Act 2011 and* is the following precepts, listed in the preferred order in which waste and resource management options should be considered— (a) AVOID unnecessary resource consumption (b) REDUCE waste generation and disposal (c) RE-USE waste resources without further manufacturing (d) RECYCLE waste resources to make the same or different products (e) RECOVER waste resources, including the recovery of energy (f) TREAT waste before disposal, including reducing the hazardous nature of waste (g) DISPOSE of waste only if there is no viable alternative.
waste and resource management principles	has the meaning provided in section 4(2)(b) of the *Waste Reduction and Recycling Act 2011* and means the: (a) polluter pays principle (b) user pays principle (c) proximity principle (d) product stewardship principle.
waste fluids	has the meaning in section 13 of the *Environmental Protection Act 1994* in conjunction with the common meaning of "fluid" which is "a substance which is capable of flowing and offers no permanent resistance to changes of shape". Accordingly, to be a waste fluid, the waste must be a substance which is capable of flowing and offers no permanent resistance to changes of shape.
watercourse	has the meaning in Schedule 4 of the *Environmental Protection Act 1994* and means: 1) a river, creek or stream in which water flows permanently or intermittently— (a) in a natural channel, whether artificially improved or not; or (b) in an artificial channel that has changed the course of the watercourse. 2) Watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.

waters	includes all or any part of a creek, river, stream, lake, lagoon, swamp, wetland, spring, unconfined surface water, unconfined water in natural or artificial watercourses, bed and bank of any waters, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and underground water.
well integrity	the ability of a well to contain the substances flowing through it.
wetland	for the purpose of this environmental authority, wetland means: • areas shown on the Map of referable wetlands which is a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D of the Environmental Protection Regulation 2008; and • areas defined under the Queensland Wetlands Program as permanent or periodic / intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six (6) metres, and possess one or more of the following attributes: o at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or o the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or o the substratum is not soil and is saturated with water, or covered by water at some time. The term wetland includes riverine, lacustrine, estuarine, marine and palustrine wetlands; and it does not include a Great Artesian Basin Spring or a subterranean wetland that is a cave or aquifer.
wetland of high ecological significance	means a wetland that meets the definition of a wetland and that is shown as a wetland of 'high ecological significance' or wetland of 'high ecological value' on the Map of referable wetlands.
wetland of other environmental value	means a wetland that meets the definition of a wetland and that is shown as a wetland of 'general environmental significance' or wetland of 'other environmental value' on the Map of referable wetlands.

END OF ENVIRONMENTAL AUTHORITY

Appendix C

Desktop searches

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 14-Oct-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	7
Listed Threatened Species:	63
Listed Migratory Species:	14

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	27
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	5
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	60
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	1200 - 1300km upstream from Ramsar site	In feature area
Narran lake nature reserve	300 - 400km upstream from Ramsar site	In feature area
Riverland	1100 - 1200km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	1300 - 1400km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities			[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps. Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.			
Community Name	Threatened Category	Presence Text	Buffer Status
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area	In feature area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community likely to occur within area	In feature area
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community likely to occur within area	In feature area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area	In feature area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area	In buffer area only
Weeping Myall Woodlands	Endangered	Community likely to occur within area	In feature area

Community Name	Threatened Category	Presence Text	Buffer Status
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In buffer area only

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In buffer area only
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area	In buffer area only
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In buffer area only
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat may occur within area	In feature area
FISH			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Endangered	Species or species habitat likely to occur within area	In feature area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area	In feature area
INSECT			
Hypochrysops piceatus Bulloak Jewel Butterfly [77869]	Critically Endangered	Species or species habitat may occur within area	In feature area
MAMMAL			
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat known to occur within area	In feature area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area	In buffer area only
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat known to occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
Acacia handonis			
Hando's Wattle, Percy Grant Wattle [14928]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Acacia lauta			
Tara Wattle [4165]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Androcalva procumbens			
[87153]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Arthraxon hispidus			
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Cadellia pentastylis			
Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Clematis fawcettii			
Stream Clematis [4311]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Dichanthium queenslandicum			
King Blue-grass [5481]	Endangered	Species or species habitat known to occur within area	In buffer area only
Dichanthium setosum			
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eucalyptus argophloia			
Queensland White Gum, Queensland Western White Gum, Lapunyah, Scrub Gum, White Gum [19748]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eucalyptus virens [10181]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Homopholis belsonii Belson's Panic [2406]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Homoranthus decumbens a shrub [55186]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Lepidium monoplocoides Winged Pepper-cress [9190]	Endangered	Species or species habitat may occur within area	In feature area
Leuzea australis listed as Rhaponticum australe Austral Cornflower, Native Thistle [9363]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Macrozamia machinii [64583]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Picris evae Hawkweed [10839]	Vulnerable	Species or species habitat known to occur within area	In feature area
Polianthion minutiflorum [82772]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Prostanthera sp. Dunmore (D.M.Gordon 8A) [84115]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Sophora fraseri [8836]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Vincetoxicum forsteri listed as Tylophora linearis [92384]	Endangered	Species or species habitat may occur within area	In buffer area only
Westringia parvifolia [4822]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Xerothamnella herbacea [4146]	Endangered	Species or species habitat known to occur within area	In feature area
REPTILE			
Anomalopus mackayi Five-clawed Worm-skink, Long-legged Worm-skink [25934]	Vulnerable	Species or species habitat known to occur within area	In feature area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat known to occur within area	In feature area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hemiaspis damelii Grey Snake [1179]	Endangered	Species or species habitat known to occur within area	In feature area
Tympanocryptis condaminensis Condamine Earless Dragon [87888]	Endangered	Species or species habitat known to occur within area	In buffer area only
SNAIL			
Adclarkia cameroni Brigalow Woodland Snail [83886]	Endangered	Species or species habitat known to occur within area	In feature area
Adclarkia dulacca Dulacca Woodland Snail [83885]	Endangered	Species or species habitat known to occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pandion haliaetus			
Osprey [952]		Species or species habitat known to occur within area	In buffer area only
Tringa glareola			
Wood Sandpiper [829]		Species or species habitat known to occur within area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In buffer area only
Tringa stagnatilis			
Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - DALBY TRAINING DEPOT [31001]	QLD	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anseranas semipalmata			
Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area overfly marine area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In buffer area only
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In buffer area only
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa glareola			
Wood Sandpiper [829]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa stagnatilis			
Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Ballara Park	Nature Refuge	QLD	In buffer area only
Chinchilla Rifle Range	Nature Refuge	QLD	In buffer area only
Irongate	Conservation Park	QLD	In buffer area only
Lake Broadwater	Resources Reserve	QLD	In buffer area only
Lake Broadwater	Conservation Park	QLD	In buffer area only

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Lake Broadwater	QLD	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Brigalow Peaking Power Plant Project	2023/09692		Completed	In buffer area only
Darling Downs Battery Energy Storage System	2024/09788		Assessment	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Development of Existing Coal Seam Gas Fields	2008/4398		Post-Approval	In feature area
Everleigh Solar Park Project	2022/09339		Post-Approval	In buffer area only
Hopeland Solar Farm Project	2023/09684		Assessment	In buffer area only
Kumbarilla Renewable Energy Park, 40kms west Dalby	2021/9018		Completed	In buffer area only
Millmerran Mining Lease Conversion Project	2022/09294		Assessment	In buffer area only
Sixteen Mile Solar Farm	2024/09827		Referral Decision	In buffer area only
Wambo Wind Farm	2020/8727		Post-Approval	In buffer area only
Controlled action				
ARG Border Rail Project Moree to Toowoomba QLD	2013/7061	Controlled Action	Further Information Request	In buffer area only
ATP1188 Anya development for 25 CSG wells, Dalby, Qld	2015/7463	Controlled Action	Post-Approval	In buffer area only
Cameby Downs Coal Mine Expansion	2009/4966	Controlled Action	Completed	In buffer area only
Construct and operate 447km high pressure gas transmission pipeline	2009/4976	Controlled Action	Post-Approval	In buffer area only
Construction and operation of Nathan Dam and associated water delivery infrastructure	2008/4313	Controlled Action	Post-Approval	In buffer area only
Construction of a high pressure buried gas pipeline, Kogan to Gladstone, QLD	2009/5029	Controlled Action	Post-Approval	In feature area
Expansion of Coal Seam Gas Fields	2009/4974	Controlled Action	Post-Approval	In feature area
Expansion Of Coal Seam Gas Operations	2010/5344	Controlled Action	Post-Approval	In feature area
Glen Wilga Open-cut Coal Mine	2003/1173	Controlled Action	Completed	In buffer area only
Inland Rail Border to Gowrie Project, QLD	2018/8165	Controlled Action	Assessment Approach	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Ironbark Coal Seam Gas Project	2011/6091	Controlled Action	Completed	In buffer area only
Queensland Curtis LNG Project - Pipeline Network	2008/4399	Controlled Action	Post-Approval	In buffer area only
Ruby Spur Line	2011/6221	Controlled Action	Post-Approval	In buffer area only
Surat Gas Project off-tenure pipelines, Surat Basin, Qld	2018/8223	Controlled Action	Post-Approval	In feature area
Underground Coal Gasification and Liquefaction Project	2007/3541	Controlled Action	Completed	In feature area
Wandoan Coal Project - Coal Seam Methane Water Supply South	2008/4287	Controlled Action	Post-Approval	In feature area
Warrego Highway Passing Lanes - Oakey to Dalby, QLD	2015/7444	Controlled Action	Completed	In buffer area only
Not controlled action				
Beelbee Solar Farm and transmission connection, Beelbee Road, Beelbee, Qld	2018/8168	Not Controlled Action	Completed	In buffer area only
Braemar 3 450MW open cycle gas-fired power station	2009/4811	Not Controlled Action	Completed	In buffer area only
Cameby Downs Coal Mine, construction, operation & decommissioning	2007/3465	Not Controlled Action	Completed	In buffer area only
Cameby Downs Continued Operations Project, Qld	2018/8304	Not Controlled Action	Completed	In buffer area only
Chances Plain Solar Farm Project	2019/8532	Not Controlled Action	Completed	In buffer area only
Chinchilla Weir Discharge and Pipeline Project	2011/6000	Not Controlled Action	Completed	In buffer area only
Coal Conveyor between New Acland Coal Mine and Tarong Power Stations	2007/3430	Not Controlled Action	Completed	In buffer area only
Construction of overtaking lanes at four locations along the Warrego Hwy	2011/5997	Not Controlled Action	Completed	In buffer area only
Darling Downs Power Station	2007/3377	Not Controlled Action	Completed	In buffer area only
Darling Downs Solar Farm, west of Dalby, Qld	2016/7694	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Edenvale Solar Park	2020/8663	Not Controlled Action	Completed	In buffer area only
Goldsmith LNG Plant	2007/3440	Not Controlled Action	Completed	In buffer area only
High Voltage Transmission line Development	2007/3230	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Inland Rail Border to Gowrie Geotechnical Investigations	2021/8911	Not Controlled Action	Completed	In buffer area only
Kogan - Braemar Transmission Line	2004/1850	Not Controlled Action	Completed	In buffer area only
Proposed Coal Seam Gas Development & Associated Infrastructure	2008/4456	Not Controlled Action	Completed	In buffer area only
Proposed gas pipeline to the Dalby Bio-refinery	2008/4001	Not Controlled Action	Completed	In buffer area only
Surat Basin to Tarong Railway project	2003/1264	Not Controlled Action	Completed	In buffer area only
Surat Development Road Works	2001/425	Not Controlled Action	Completed	In buffer area only
Tipton Gas Pipeline	2004/1797	Not Controlled Action	Completed	In buffer area only
Upgraded sewerage infrastructure in the Helensvale/Coombabah catchment	2004/1427	Not Controlled Action	Completed	In buffer area only
Warrego Highway Upgrade Program, Dalby to Miles overtaking lanes, Qld	2016/7802	Not Controlled Action	Completed	In buffer area only
Western Downs Green Power Hub, Hopeland, Qld	2018/8301	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
132kV transmission line	2003/1024	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Chinchilla Solar Farm	2017/7942	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
Construction and operation of gas pipeline	2005/2254	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Dalby Gas Expansion Project	2010/5343	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Darling Downs Power Station 2	2010/5417	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Development of gas fired peaking power station	2005/2135	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Millmerran - Middle Ridge transmission line	2003/1103	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
Construction of 450MW open cycle gas-fired power station	2009/4729	Referral Decision	Completed	In buffer area only
Eradicate and Control Diacanthium Sericeum(Queensland Blue Grass)	2009/4934	Referral Decision	Completed	In buffer area only
Wilkie Creek Coal Mine	2010/5418	Referral Decision	Completed	In buffer area only

Bioregional Assessments			[Resource Information]
SubRegion	BioRegion	Website	Buffer Status
Maranoa-Balonne-Condamine	Northern Inland Catchments	BA website	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Queensland Government

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: Native
Queensland status: Rare and threatened species
Records: All
Date: All
Latitude: -27.2221
Longitude: 150.9041
Distance: 80
Email: matthew.whitehouse@attexo.com.au
Date submitted: Monday 14 Oct 2024 11:54:43
Date extracted: Monday 14 Oct 2024 12:00:03

The number of records retrieved = 89

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Limnodynastidae	*Adelotus brevis*	tusked frog		V		2
animals	birds	Acanthizidae	*Aphelocephala leucopsis*	southern whiteface		V	V	7
animals	birds	Accipitridae	*Erythrotriorchis radiatus*	red goshawk		E	E	3
animals	birds	Apodidae	*Hirundapus caudacutus*	white-throated needletail		V	V	85
animals	birds	Ardeidae	*Botaurus poiciloptilus*	Australasian bittern		E	E	1
animals	birds	Cacatuidae	*Cacatua leadbeateri leadbeateri*	Major Mitchell's cockatoo		E	E	3
animals	birds	Cacatuidae	*Calyptorhynchus lathami*	glossy black-cockatoo		V		3
animals	birds	Cacatuidae	*Calyptorhynchus lathami lathami*	glossy black-cockatoo (eastern)		V	V	49
animals	birds	Columbidae	*Geophaps scripta scripta*	squatter pigeon (southern subspecies)		V	V	9
animals	birds	Diomedeidae	*Diomedea exulans*	wandering albatross		V	V	1
animals	birds	Estrildidae	*Stagonopleura guttata*	diamond firetail		V	V	16
animals	birds	Falconidae	*Falco hypoleucos*	grey falcon		V	V	4
animals	birds	Meliphagidae	*Anthochaera phrygia*	regent honeyeater		CR	CE	10/1
animals	birds	Meliphagidae	*Grantiella picta*	painted honeyeater		V	V	219
animals	birds	Menuridae	*Menura alberti*	Albert's lyrebird		NT		1
animals	birds	Pedionomidae	*Pedionomus torquatus*	plains-wanderer		CR	CE	2
animals	birds	Petroicidae	*Melanodryas cucullata cucullata*	hooded robin (south-eastern)		E	E	1
animals	birds	Procellariidae	*Ardenna pacifica*	wedge-tailed shearwater		V		1/1
animals	birds	Psittaculidae	*Cyclopsitta diophthalma coxeni*	Coxen's fig-parrot		CR	CE	1
animals	birds	Psittaculidae	*Lathamus discolor*	swift parrot		E	CE	2
animals	birds	Psittaculidae	*Psephotellus pulcherrimus*	paradise parrot		PE	EX	1
animals	birds	Rostratulidae	*Rostratula australis*	Australian painted-snipe		E	E	10
animals	birds	Scolopacidae	*Calidris acuminata*	sharp-tailed sandpiper		V	V	72
animals	birds	Scolopacidae	*Calidris ferruginea*	curlew sandpiper		CR	CE	5
animals	birds	Scolopacidae	*Gallinago hardwickii*	Latham's snipe		V	V	54
animals	birds	Scolopacidae	*Limosa lapponica baueri*	Western Alaskan bar-tailed godwit		E	E	3
animals	birds	Scolopacidae	*Limosa limosa*	black-tailed godwit		E	E	4
animals	birds	Scolopacidae	*Tringa nebularia*	common greenshank		E	E	14
animals	birds	Strigidae	*Ninox strenua*	powerful owl		V		8
animals	birds	Turnicidae	*Turnix melanogaster*	black-breasted button-quail		V	V	19
animals	insects	Lycaenidae	*Jalmenus eubulus*	pale imperial hairstreak		V		72
animals	mammals	Dasyuridae	*Dasyurus maculatus maculatus*	spotted-tailed quoll (southern subspecies)		E	E	7/1
animals	mammals	Petauridae	*Petaurus australis australis*	yellow-bellied glider (southern subspecies)		V	V	7
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		E	E	350
animals	mammals	Pseudocheiridae	*Petauroides volans volans*	southern greater glider		E	E	23
animals	mammals	Vespertilionidae	*Chalinolobus dwyeri*	large-eared pied bat		E	E	1
animals	mammals	Vespertilionidae	*Nyctophilus corbeni*	eastern long-eared bat		V	V	11
animals	ray-finned fishes	Terapontidae	*Bidyanus bidyanus*	silver perch		E	E	5/1
animals	reptiles	Agamidae	*Tympanocryptis condaminensis*	Condamine earless dragon		E	E	143/48
animals	reptiles	Boidae	*Aspidites ramsayi*	woma		NT		2
animals	reptiles	Diplodactylidae	*Strophurus taenicauda*	golden-tailed gecko		NT		269/10
animals	reptiles	Elapidae	*Acanthophis antarcticus*	common death adder		V		9
animals	reptiles	Elapidae	*Furina dunmalli*	Dunmall's snake		V	V	2
animals	reptiles	Elapidae	*Hemiaspis damelii*	grey snake		E	E	73/5

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	reptiles	Pygopodidae	*Delma torquata*	collared delma		V	V	3
animals	reptiles	Scincidae	*Anomalopus mackayi*	long-legged worm-skink		E	V	20/1
animals	reptiles	Scincidae	*Egernia rugosa*	yakka skink		V	V	6
animals	reptiles	Scincidae	*Lampropholis colossus*	Bunya sunskink		NT		18
animals	snails	Camaenidae	*Adclarkia cameroni*			E	E	3
plants	land plants	Acanthaceae	*Xerothamnella herbacea*			E	E	3/1
plants	land plants	Asteraceae	*Camptacra perdita*			E		1/1
plants	land plants	Asteraceae	*Cymbonotus maidenii*			E		12/9
plants	land plants	Asteraceae	*Lagenophora fimbriata*			V		1/1
plants	land plants	Asteraceae	*Leuzea australis*			V	V	24/17
plants	land plants	Asteraceae	*Picris barbarorum*			V		19/18
plants	land plants	Asteraceae	*Picris evae*			V	V	16/6
plants	land plants	Asteraceae	*Rutidosis glandulosa*			NT		4/4
plants	land plants	Asteraceae	*Rutidosis lanata*			NT		44/42
plants	land plants	Celastraceae	*Denhamia parvifolia*			V	V	1/1
plants	land plants	Cupressaceae	*Callitris baileyi*	Bailey's cypress		NT		17/13
plants	land plants	Cyperaceae	*Cyperus clarus*			V		6/5
plants	land plants	Cyperaceae	*Fimbristylis vagans*			E		4/4
plants	land plants	Haloragaceae	*Haloragis exalata subsp. velutina*			V	V	5/5
plants	land plants	Lamiaceae	*Prostanthera sp. (Dunmore D.M.Gordon 8A)*			V	V	5/5
plants	land plants	Lamiaceae	*Westringia parvifolia*			V	V	1/1
plants	land plants	Lauraceae	*Cryptocarya floydii*	gorge laurel		NT		6/5
plants	land plants	Leguminosae	*Acacia handonis*	Hando's wattle		V	V	1/1
plants	land plants	Leguminosae	*Acacia lauta*	Tara wattle		V	V	8/8
plants	land plants	Leguminosae	*Acacia wardellii*			NT		27/19
plants	land plants	Myrtaceae	*Eucalyptus argophloia*	Queensland western white gum		CR	V	22/16
plants	land plants	Myrtaceae	*Eucalyptus curtisii*	Plunkett mallee		NT		11/10
plants	land plants	Myrtaceae	*Eucalyptus virens*	shiny-leaved ironbark		V	V	3/3
plants	land plants	Myrtaceae	*Micromyrtus carinata*	Gurulmundi heath-myrtle		E		2/2
plants	land plants	Myrtaceae	*Rhodamnia dumicola*	rib-fruited malletwood		E		1/1
plants	land plants	Orchidaceae	*Diuris parvipetala*			V		1/1
plants	land plants	Poaceae	*Bothriochloa bunyensis*	Bunya Mountains bluegrass		V	V	9/9
plants	land plants	Poaceae	*Calyptochloa gracillima subsp. ipsviciensis*			CR		1/1
plants	land plants	Poaceae	*Dichanthium queenslandicum*			V	E	9/7
plants	land plants	Poaceae	*Digitaria porrecta*			NT		287/48
plants	land plants	Poaceae	*Homopholis belsonii*	Belson's panic		E	V	73/65
plants	land plants	Ranunculaceae	*Clematis fawcettii*			V	V	6/6
plants	land plants	Rhamnaceae	*Polianthion minutiflorum*			V	V	1/1
plants	land plants	Rhamnaceae	*Pomaderris coomingalensis*			E		1/1
plants	land plants	Rutaceae	*Philotheca sporadica*			E		2843/71
plants	land plants	Rutaceae	*Zieria obovata*			V	V	1
plants	land plants	Santalaceae	*Thesium australe*	toadflax		V	V	9/9
plants	land plants	Solanaceae	*Solanum papaverifolium*			E		15/15
plants	land plants	Solanaceae	*Solanum stenopterum*			E		9/7
plants	land plants	Surianaceae	*Cadellia pentastylis*	ooline		V	V	1

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.*
The codes are Extinct (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.*
The values of EPBC are Extinct (EX), Extinct in the Wild (XW), Critically Endangered (CE), Endangered (E), Vulnerable (V) and Conservation Dependent (CD).

Records - The first number indicates the total number of records of the taxon (wildlife records and species listings for selected areas).
This number is output as 99999 if it equals or exceeds this value. A second number located after a / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

Appendix D

Likelihood of occurrence assessments

Common Name	Scientific Name	EPBC Status	NC Status	Source	Habitat Description	Likelihood of Occurrence
Bird Species						
Albert's lyrebird	*Menura alberti*	-	V	WildNet	Albert's Lyrebird is endemic to Australia and has one of the smallest distributional ranges of any bird on the continent. It is confined to a small region around the border of far south-east QLD and far north-east NSW. They are mostly confined to rainforests and wet sclerophyll forests with a mesic understory, usually at altitudes of more than 300m. They are typically located in gullies, along watercourses, and on the slopes and ridges of steep mountain ranges (SPRAT 2017).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Australasian Bittern	*Botaurus poiciloptilus*	E	V	PMST, WildNet	Occurs from southern Queensland to Tasmania and south eastern South Australia. In NSW this species has been recorded along the coast as well as inland wetlands and rivers (NPWS, 1999). The Australasian Bittern occurs in estuarine and freshwater wetlands with tall dense vegetation, including sedges, spike rushes, reeds and bulrush (NPWS, 2000; NPWS, 1999). It favours wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water Feeds mostly at night upon frogs, yabbies, spiders, insects, snails, small fish and mice (Schodde and Tidemann, 1993; NPWS, 2000).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Australian Painted Snipe	*Rostratula australis*	E, Ma	E	PMST, WildNet	The Australian Painted Snipe is a secretive, nomadic inhabitat of ephemeral and permanent wetlands of inland Australia. It has been recorded in scattered locations throughout much of Qld, with important areas including the Qld Channel Country and the Fitzroy Basin. It occurs in freshwater or brackish wetlands such as lakes, swamps, claypans, inundated or waterlogged grassland and saltmarsh. Typically, habitat has a moasaic of concealing vegeatation, exposed mud and shallow water, but when dispersing in response to poor conditions atyical habitats are often used (Menkhorst et al. 2017).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Black-breasted Button-quail	*Turnix melanogaster*	V	V	PMST, WildNet	The Black-breasted Buttonquail (BBBQ) occurs in coastal and near-coastal areas of south-east Queensland. The BBBQ has specific habitat requirements; preferred habitats include dense forest or thicket vegetation with a closed canopy, a dense layer of midstorey vegetation, and a variable ground cover mosaic, which includes both open areas with deep leaf litter and areas of ground covering vegetation (DCCEEW 2022). BBBQ typically require a dense layer of leaf litter and/or soft friable soil, in which they forage for the invertebrates (including beetles, ants and earwigs) that are their main source of food (DCCEEW 2022).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Black-tailed Godwit	*Limosa limosa*	E, Mi, Ma	-	PMST, WildNet	The temperate or tropical winter habitats are usually located around intertidal areas along muddy coastlines, estuaries, lagoons, sewage ponds, brackish or saline inland lakes, flooded pastures and airfields (Pizzey and Knight 1999).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Blue-winged Parrot	*Neophema chrysostoma*	V, Ma	V	PMST	The Blue-winged parrot breeds on mainland Australia south of the Great Dividing Range in southern VIC from Port Albert in Gippsland west to Nelson, and sometimes in the far south-east of SA, and north-western, central and eastern parts of TAS. This species inhabits a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. They tend to favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones. This species can also be seen in altered environments such as airfields, gold-courses and paddocks. Pairs of small parties of Blue-winged parrots forage mainly near or on the ground for seeds of a wide range of native and introduced grasses, herbs and shrubs (SPRAT, 2023).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the primary distribution of this species.
Brown Treecreeper (south-eastern)	*Climacteris picumnus victoriae*	V	V	PMST	The south-eastern Brown Treecreeper is endemic to south-eastern Australia, from the Grampians (western Vic) through central NSW to the Bunya Mountains (Qld). The subspecies occupies dry eucalypt forests and woodlands, particularly those dominated by stringybarks or other rough-barked eucalypts; preferred habitats usually have an open grassy understorey, sometimes with one or more shrub species. The subspecies is not usually found in woodlands with a dense shrub layer, and it is absent from heavily degraded woodlands and steep rocky hills. Optimal habitat must experience some kind of ongoing disturbance regime (historically Indigenous burning practices) to keep the ground layer from becoming too dense and uniform (DCCEEW 2023).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Common Greenshank	*Tringa nebularia*	E, Mi, Ma	-	PMST, WildNet	In Queensland, the species is widespread in the Gulf country and eastern Gulf of Carpentaria (SPRAT, 2010). Found in mudflats, estuaries, saltmarshes, margins of lakes, wetlands, claypans, fresh and salines, commercial saltfields, sewage ponds (Pizzey and Knight 1999).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Common Sandpiper	*Actitis hypoleucos*	Mi, Ma	-	PMST	The Common Sandpiper is a Holarctic migratory shorebird occurring in Australia during its non-breeding season. In Australia it primarily frequents sheltered coastal and subcoastal habitats such as riverbanks and small estuaries, often preferring areas with a mosaic of rocks and muddy fringes, but also occurs inland on the fringes of freshwater dams, lakes, and wetlands. It readily utilises disturbed or man-made habitats, such as storm channels, flooded parklands, and sea walls. It is typically present in Australia between late July and March (Menkhorst et al. 2019).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Coxen's Fig-parrot	*Cyclopsitta diophthalma coxeni*	CE	V	WildNet	The distribution of the Coxen's Fig-Parrot is poorly known. Based on accepted records, the core distribution extends from Gympie in south-eastern QLD to Richmond River in north-eastern NSW. They occupy habitats that occur from sea level to approximately 900m above sea level. They occur in rainforest habitats including subtropical rainforest, dry rainforest, littoral and developing littoral rainforests and vine forests (SPRAT 2010).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Curlew Sandpiper	*Calidris ferruginea*	CE, Mi, Ma	V	PMST, WildNet	In Australia, the Curlew Sandpiper is most common in the far south-east and north-west of the country, where it occurs primarily in coastal sites, but may also be found inland in suitable wetland habitats. In Qld, the species is widespread along the coast south of Cairns, and sparsely scattered inland. On the coast, the species prefers intertidal mudflats in sheltered areas; inland, it is found around ephemeral and permanent lakes, dams and waterholes, usually those with bare edges of mud or sand. The species is typically present in Australia between August and March (DCCEEW 2023).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.

Common Name	Scientific Name	EPBC Status	NC Status	Source	Habitat Description	Likelihood of Occurrence
Diamond Firetail	*Stagonopleura guttata*	V	V	PMST, WildNet	Diamond Firetails occur on the south-east mainland of Australia from south-east QLD to Eyre Peninsula, SA and about 300 km inland from the sea. This species occurs in eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees. They tend to prefer areas with relatively low tree density, few large logs, and little litter cover but high grass cover (SPRAT, 2023).	**Likely to Occur**. Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is approximately 3 km to the north-east (ALA, 2012).
Fork-tailed Swift	*Apus pacificus*	Mi,Ma	-	PMST	The Fork-tailed Swift is a migratory species that can occur anywhere in Australia. The species is predominantly aerial while in Australia, is highly mobile and forages over a variety of habitat types, though perhaps is most common over inland plains. It sometimes occurs in large foraging flocks of 100's or 1000's of birds, which may forage from near ground level to hundreds of metres above the ground. The species is typically present in Australia between approx. October and April (Menkhorst et al. 2019).	**Likely to Occur**. This species is predominantly aerial and can occur anywhere in Australia. Suitable foraging habitat is likely to be present in the airspace above the Study area and nearby historical records have been identified. The nearest record is approximately 7 km to the north (ALA, 2015).
Glossy Black-cockatoo (south-eastern)	*Calyptorhynchus lathami sensu lato*	V	V	PMST, WildNet	The southern Glossy Black Cockatoo has a widespread distribution, ranging from Gympie to the south-east QLD border, inland to Augathella and Tambo. The distribution of this species continues south into NSW spreading inland to the central western plains and also occurs in the eastern coastal Gippsland region of VIC. This species prefers woodland areas dominated by she-oak (Allocasuarina) or open sclerophyll forests and woodland with a stratum of Allocasuarina beneath Eucalyptus, Corymbia or Angophora. Glossy black-cockatoos have also been observed in mixed Allocasaurina, Casuarina, cypress Callitris and brigalow (Acacia harpophylla) woodland assemblages (Hourigan, 2012).	**Known to Occur**. Suitable habitat has been identified within the Study area and nearby historical records have been identified within the Study area (ALA, 2005).
Grey Falcon	*Falco hypoleucos*	V	V	PMST, WildNet	The Grey Falcon occurs in low densities throughout arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and WA. The species is mainly found where annual rainfall is less than 500 mm, and is very rare east of the Great Dividing Range. It frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined watercourses, but has also been observed hunting in treeless areas and also occurs in tussock grassland and open woodlands, especially in winter. The species is also attracted to artificial structures, with tall transmission towers providing roosting and breeding habitat (Menkhorst et al. 2019; TSSC 2020).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Hooded Robin (south-eastern)	*Melanodryas cucullata cucullata*	E	E	WildNet	The South-eastern Hooded Robin occurs in south-eastern Australia from far south-east QLD to Yorke Peninsula, SA, intergrading with M. c.picata in the southern Murray-Darling basin. This subspecies is now absent from many formerly occupied sites, particularly in the wetter areas of the south and east. This species is described as shy and largely sedentary, and are mostly seen in pairs of small groups. They prefer dry eucalypt and acacia woodlands and shrublands with an open understorey, some grassy areas and a complex ground layer. They avoid woodlands with tall trees or dense tree cover but sometimes occur in tall, dense heaths with scattered open areas (SPRAT, 2023).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Latham's Snipe	*Gallinago hardwickii*	V, Mi, Ma	V	PMST, WildNet	Latham's Snipe is a non-breeding visitor to south-eastern Australia, and is a passage migrant through northern Australia. This species has been recorded along the east coast of Australia from Cape York Peninsula through to south-eastern SA. It occurs in permanent and ephemeral wetlands up to 2000m ASL, where they usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). They can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity (SPRAT, 2023).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Major Mitchell's cockatoo	*Cacatua leadbeateri leadbeateri*	E	E	WildNet	Major Mitchell's cockatoo occurs in the Murray-Darling, Eyre and Bulloo River Basins, from Isisford and Roma in the north, through western NSE to north-western VIC and west to eastern SA. This subspecies had disappeared from the Adelaid and Mt Mary Plains in SA by the 1950s. IT is assumed that only 20-30% of its remaining range is still occupied. This subspecies lives in arid and semi-arid woodlands dominated by mulga (Acacia aneura), malle and box eucalypts, slender cypress pine (Callitris gracilis) or belah (Casuarina cristata). Within these vegetation communities, the subspecies main requirements are fresh surface water, and trees with suitable nesting hollows). They tend to have very specific hollow requirements. Suitable nesting hollows are found in trees that are large and tall relative to the typical structure of arid and semi-arid woodlands. Therefore, nesting trees, which are mainly eucalypts or cypress pines, are usually old. The birds prefer to feed in or close to wooded areas where they feed on seeds of native shrubs and trees, and sometimes roots, bulbs, insect larvae and seeds of crops and weeds. They typically forage within wooded areas that are also used to travel between feeding areas and nesting/roosting areas. In fragmentated landscapes, individuals travel along vegetated corridors (SPRAT Profile).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Marsh Sandpiper	*Tringa stagnatilis*	Mi,Ma	-	PMST	The Marsh Sandpiper lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks (SPRAT, 2010).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Oriental Cuckoo	*Cuculus optatus*	Mi	-	PMST	The Oriental Cuckoo is a regular non-breeding migrant to coastal northern and eastern Australia. Preferred habitat for the species in Australia includes monsoonal rainforest, vine thickets, wet sclerophyll forest or open Casuarina, Acacia, or Eucalyptus woodlands, in which it often occurrs at the ecotones between habitat types. It is most frequently recorded in Australia between November and March (DoE 2015; Menkhorst et al. 2019).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Osprey	*Pandion haliaetus*	Mi,Ma	-	PMST	The Osprey has a broad global distribution and occurs around the entire coast of Australia. Occasionally, individuals also occur inland. The species forages for fish in fresh, brackish, or saline waters of rivers, lakes, estuaries and inshore coastal waters. Nests are usually located near a suitable area of foraging habitat and are a bulky structure made from piled sticks, often positioned in a tall dead tree or in artificial structures such as telecommunication towers or poles (Menkhorst et al. 2019).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.

Common Name	Scientific Name	EPBC Status	NC Status	Source	Habitat Description	Likelihood of Occurrence
Painted Honeyeater	*Grantiella picta*	V	V	PMST, WildNet	The Painted Honeyeater is sparsely distributed from southeastern Australia through to northwestern Qld and eastern NT. The greatest concentration of records occur south of 26ºS on inland slopes of the GDR between the Grampians (Vic) and Roma (Qld). The species is migratory, moving north in winter. It is typically found in proximity to preferred food sources (fruiting mistletoes). It inhabits eucalypt forests and woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, Callitris, and trees on farmland or in gardens. It prefers woodlands with a higher number of mature trees (i.e., those with more mistletoes), but, in the north of its range may wander into arid and semi-arid scrubs (DoE 2015; Menkhorst et al. 2019).	**Likely to Occur**. Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is approximately 7 km to the north (ALA, 2016).
Paradise Parrot	*Psephotellus pulcherrimus*	EX	EX	WildNet	The paradise Parrot has been listed as extinct in the wild since 2000. It formerly occurred in central and southern QLD, north near Brisbane to sites near Duaringa and on the Comet and Nogoa Rivers, and west to St George. There have also been unconfirmed reports from north-eastern NSW and northern QLD, which are currently thought to be incorrect. This species formerly inhabited undulating river valleys, lightly timbered with eucalypt woodlands or open forests, often dominated by ironbarks and bloodwoods, with an understory of annual and perennial native grasses. These areas were often dotted with termitaria. Little is known about the diet, movement or reproductive traits of this species (SPRAT Profile).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Pectoral Sandpiper	*Calidris melanotos*	Mi,Ma	-	PMST	This species if found in shallow fresh waters, often with low grass and other herbage; swamp margins, flooded pastures, sewage ponds; occasionally tidal areas and saltmarshes (Pizzey and Knight 1999).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Plains-wanderer	*Pedionomus torquatus*	CE	CR	WildNet	The Plains-wanderers are distributed across the north-central VIC, southern NSW around the Riverina region, eastern SA and west-central QLD. This species inhabits sparse grasslands with cover of 50% bare ground, with most vegetation less than 5 cm in height and some widely spaced plants up to 30 cm high. This species may occasionally use lower-quality habitat including cereal stubble, but cannot persist in an agricultural landscape. They are sedentary for as long as the habitat remains suitable (DoE, 2015).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Powerful Owl	*Ninox strenua*	-	V	WildNet	The Powerful Owl occurs from south-eastern Qld to Vic, where it inhabits open forests and woodlands, as well as sheltered gullies in wet forests with dense understoreys, particularly along watercourses. The species requires mature trees providing large hollows for nesting. The species also occurs in urban areas (where suitable nesting habitat remains), taking advantage of the large populations of arboreal mammals and flying-foxes (Menkhorst et al. 2019).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Red Goshawk	*Erythrotriorchis radiatus*	E	E	PMST, WildNet	The Red Goshawk is currently known to occur from the Kimberly in WA east to Cape York Peninsula in Qld. The historical range of the species extended through Qld into NSW, however, in the last decade records south of Cape York Peninsula are increasingly scant, and the species has experienced a rapid contraction of its range in that time (McColl et al. 2023). The species inhabits biodiverse mosaics of mostly eucalypt-dominated open forests and woodlands, in permanently watered, varied terrain. Favoured vegetation types include eucalypt woodland, tall open forest, gallery rainforest, swamp sclerophyll forest and rainforest margins. Nests are typically restricted to trees >20 m tall and within 1 km of (and often beside) a watercourse (DCCEEW 2023).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Regent Honeyeater	*Anthochaera phrygia*	CE	CR	PMST, WildNet	Inhabits dry open forest, woodlands, especially red ironbark, yellow box, yellow gum, particularly along creek flats; mistletoe on river oak; trees in farmland, streets, gardens (Pizzey and Knight 1999). This species is a patchy, irregular spring-summer breeding migrant to Dubbo-Warrumbungle NP, Munghorn Gap NR-Hunter R. and Windsor regions (NSW) (Pizzey and Knight 1999).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded.
Sharp-tailed Sandpiper	*Calidris acuminata*	V, Mi, Ma	-	PMST, WildNet	The Sharp-tailed Sandpiper is a non-breeding migrant to Australia which occurs in all states and territories, though mostly in the southeast of Australia in both inland and coastal locations. In Qld, the species is widespread along the coast and sparsely scattered inland. The species uses fresh, saline and hypersaline environments, feeding along the edge of water on mudflats, coastal and inland wetlands, and sewage ponds. After rainfall events, the species may also feed on areas of agricultural pasture. The species is typically present in Australia between August and April (DCCEEW 2024).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Southern Whiteface	*Aphelocephala leucopsis*	V	V	PMST, WildNet	Southern Whiteface occur across most of mainland Australia south of the tropics from the north-eastern edge of the WA wheatbelt east to the Great Dividing Range. In Qld, the species is largely confined to the southwest of the Mitchell Grass Downs and along the southern state border. They inhabit a wide range of open eucalypt or acacia woodlands and shrublands with an understory of grasses and/or shrubs. The species forages almost exclusively on the ground for insects, spiders and seeds, and favours habitat with low tree densities, a herbaceous understory and good litter cover (DCCEEW 2023).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Squatter Pigeon (southern)	*Geophaps scripta scripta*	V	V	PMST, WildNet	The known distribution of the southern Squatter Pieon extends south from the Burdekin-Lynd divide in Central Queensland to the Border Rivers region of northern NSW, and from the east coast of Queensland inland to Hughenden, Longreach and Charleville. The subspecies habitat is generally defined as open forests to sparse, open woodlands and scrub mostly dominated by eucalypts, Corymbia, Acacia or Callitris species. They are disturbance-tolerant, often occuring in agricultural areas around cattle yards, but are usually found within 3 km of permanent water (TSSC 2015; Menkhorst et al. 2019).	**Potential to Occur**. Whilst this species has been described as transient for the Broader SGP Project, suitable dispersal habitat is likely to occur within the Study area and nearby historical records have been identified. The nearest record is approximately 43 km to the north-west (ALA, 1997).
Swift Parrot	*Lathamus discolor*	CE, Ma	E	PMST, WildNet	The Swift Parrot breeds in Tasmania, and the entire population migrates north to mainland Australia for the winter. On the mainland, the species disperses widely to forage on flowers and psyllid lerps in eucalypts. The majority are found in NSW and Vic, but small numbers are observed in south-eastern Qld on a regular basis. Non-breeding birds preferentially feed in inland box-ironbark and grassy woodlands, as well as coastal swamp mahogany (Eucalyptus robusta) and spotted gum (Corymbia maculata) woodland when in flower (TSSC 2016).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.

Common Name	Scientific Name	EPBC Status	NC Status	Source	Habitat Description	Likelihood of Occurrence
Wandering Albatross	*Diomedea exulans*	V	V	WildNet	The wandering albatrosses spend the majority of their time in flight, soaring over the southern oceans. They breed on a number of islands just north of the Antarctic Circle. They breed on ridges and hillocks, amongst open and patchy vegetation (www.arkive.org).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Wedge-tailed Shearwater	*Ardenna pacifica*	E	V	PMST	The Wedge-tailed shearwater is widely distributed across the tropical pacific and Indian Oceans. It is known to breed on the east and west coast of Australia. It nests on low, flat islands, sand spits or atolls with little or no vegetation. It is a mostly pelagic species (www.arkive.com).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area. The Study area is also outside the known distribution of this species.
Western Alaskan Bar-tailed Godwit	*Limosa lapponica baueri*	E	E	PMST	The bar-tailed godwit (both subspecies combined) have been recorded in the coastal areas of all Australian states. It is widespread in the Torres Strait and along the eastern and south-east coasts of QLD, NSW and VIC. These species migrate southwards for the boreal winter. L. l. menzbieri has a more westerly migration than L. l. baueri. They are usually located around intertidal areas along muddy coastlines, estuaries, lagoons, sewage ponds, brackish or saline inland lakes, flooded pastures and airfields (Pizzey and Knight 1999, Threatened Species Scientific Committee)	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
White-throated Needletail	*Hirundapus caudacutus*	V, Mi, Ma	V	PMST, WildNet	The White-throated Needletail is a non-breeding migrant to Australia, and, when present, is widespread in eastern and south-eastern Australia. It has been recorded in all coastal regions of Qld, extending inland to the western slopes of the GDR and occasionally onto adjacent plains. In Australia, the species was thought to be almost exclusively aerial, foraging from <1 m to >2000 m above the ground, but recent evidence suggests that roosting in the canopy of woodlands is a common behaviour (see Tarburton 2021; Vanderduys et al. 2024). The species has been recorded foraging over various habitats, including open forests, rainforest, heathlands, grasslands and farmlands, partly cleared pasture, plantations or remnant vegetation at the edge of paddocks (TSSC 2019).	**Likely to Occur**. This species is predominantly aerial and can occur anywhere in Australia. Suitable foraging habitat is likely to be present in the airspace above the Study area and nearby historical records have been identified. The nearest record is approximately 7 km to the north (ALA, 2021).
Wood Sandpiper	*Tringa glareola*	Mi,Ma	-	PMST	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially Melaleuca and River Red Gums (Eucalyptus camaldulensis) and often with fallen timber (SPRAT, 2010). Regular summer migrant to Australia from September to April (Pizzey and Knight 1999).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded.
Yellow Wagtail	*Motacilla flava*	Mi,Ma	-	PMST	The Yellow Wagtail is a regular wet season visitor to northern Australia; on the east coast, it is considered a vagrant further south than Townsville. Habitat requirements are highly variable, but typically include flat grassy areas near water, as well as a variety of freshwater habitats (DoE 2015).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Amphibian Species						
Tusked Frog	*Adelotus brevis*	-	V	WildNet	The Tusked Frog inhabits wet eucalypt forest, rainforest, and sometimes dry eucalypt forest, where it can be found in close proximity to suitable breeding habitat such as ponds and slow-moving sections of streams. (Cogger 2000).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Mammal Species						
Corben's Long-eared Bat	*Nyctophilus corbeni*	V	V	PMST, WildNet	Corben's long-eared bat is patichily distributed across southern central Qld, central western NSW, northwestern Vic and eastern SA. Most of its range occurs within the Murray-Darling Basin, and the majority of records occur inland of the Great Dividing Range. The species inhabits a variety of inland woodland vegetation types, including box/ironbark/cypress pine woodlands, Buloke woodlands, Brigalow woodlands, Belah woodlands, smooth-barked apple woodlands, river red gum forest, black box woodland, and various types of tree mallee. In Qld, it can inhabit this variety of vegetation, however is distinctly more common in box/ironbark/cypress pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern QLD. This species is more abundant in extensive stands of vegetation in comparison to smaller woodland patches, suggesting its home range is probably large. This species has also been found to be much more abundant in habitats that have a distinct tree canopy and a dense, cluttered understory layer (TSSC, 2015).	**Potential to Occur**. Potentially suitable habitat for this species has been identified within the Study area, and nearby historical records have been identified. These nearby records are mostly associated with Condamine State Forest (approximately 40 km to the west) (ALA, 2001) and other nearby forests and parks including Bunya Mountains National Park and Bulli State Forest. Considering that there are no closer records, this species is only considerd to have a potential to occur within the Study area.
Ghost Bat	*Macroderma gigas*	V	E	PMST	The species current known range is discontinuous, with geographically distinct colonies occurring in northern WA, northern NT, the Gulf of Carpentaria, coastal and near coastal eastern Qld, and western Qld. Populations are highly structured and genetically distinct at local and regional scales. The species occupies a wide range of habitats and occurs in arid areas, tropical savanna woodlands and rainforests. They require undisturbed roost sites, such as caves, rock crevices and abandoned mine shafts. On average, they forage ~2 km from the daytime roost. They have been found to move between caves seasonally and may require a range of cave sites (TSSC 2016).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Greater Glider (southern and central)	*Petauroides volans sensu lato*	E	E	PMST, WildNet	The southern and central Greater Glider occurs in eastern Australia, where it has a broad distribution from around Proserpine in QLD, south through NSW and the ACT, to Wombat State Forest in central VIC. This species is largely restricted to eucalypt forests and woodlands of eastern Australia. It is typically found in highest abundance in taller, montane, moist eucalypt forests on fertile soils, with relatively old trees and abundance hollows. It is likely that only a proportion of forest in potential habitat areas is suitable for the species, as the structural attributes of the forest overstorey and forage quality it relies on vary considerably across the landscape (TSSC Conservation Advice, 2022).	**Potential to Occur**. Suitable habitat for this species has been identified within the Study area, and nearby historical records have been identified. The nearest historical record is approximately 21 km to the south (ALA, 2010).

Common Name	Scientific Name	EPBC Status	NC Status	Source	Habitat Description	Likelihood of Occurrence
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	-	PMST	Australia's only endemic Flying-fox, the species occurs in coastal areas from central Qld to SA. Only a small portion of this range is used at any one time, as the species selectively forages where food is available. A generalist, the species may occur in a variety of vegetation communities including rainforests, open forests, woodlands, Melaleuca swamps and Banksia woodlands. The species has adopted complex migration traits in response to ephemeral and patchy food resources. The species is colonial, with daaytime camps usually found in tall, closed forests near a water source. However, due to the species' nomadism, camps are rarely permanent and are usually temporarily seasonally occupied (TSSC 2001; DAWE 2021).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded. Additionally, no nationally recognised flying-fox camps that have recorded this species have been identified within 50 km of the Study area.
Koala	*Phascolarctos cinereus*	E	E	PMST, WildNet	The Koala is endemic to Australia. The biological species range extends from north-eastern QLD to the south-east corner of SA. Koalas naturally inhabit a range of temperate, subtropical and tropical forests, woodland and semi-arid community's dominated by Eucalyptus species. Their habitat can broadly be defined as any forest or woodland containing species that are a known Koala food tree, or shrubland with emergent food trees (SPRAT 2017).	**Known to Occur**. Suitable habitat has been identified within the Study area and nearby historical records have been identified within the Study area (ALA, 2009).
Large-eared Pied Bat	*Chalinolobus dwyeri*	E	E	PMST, WildNet	The species' current distribution is poorly known, but records indicate that it occurs from Shoalwater Bay on the central Qld coast south to the vicinity of Ulladulla, NSW. It is believed to be restricted within this range. In Qld, records are known from the Carnarvon, Expedition Ranges and Blackdown Tablelands. It is typically found in areas with cliffs, escarpments or rocky outcrops for roosting (typically sandstone, but also rhyolite), with suitable caves, overhangs and cracks. Foraging habitat includes fertile valleys and plains, as well as areas with moderately tall woodland areas along watercourses and upper slopes of crests and ranges. Evidence suggests that the species requires roosting and foraging habitat occuring in proximity; without both habitat types being present, it is unlikely to occur (DCCEEW 2023).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Northern Quoll	*Dasyurus hallucatus*	E	-	PMST	The northern quoll occurs across much of northern Australia, from south-eastern Queensland to the south-west Kimberley, with a disjunct population in the Pilbara. In the Northern Territory it is restricted to the Top End. The species occupies a diversity of habitats across its range which includes rocky areas, eucalypt forest and woodlands, rainforest, sandy lowlands and beaches, shrubland, grasslands and desert. The habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal (SPRAT 2012).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Short-beaked Echidna	Tachyglossus aculeatus	-	SLC	Arrow	The Short-beaked Echidna lives in forest and woodlands, heath, grasslands and arid environments. It is found throughout Australia, including Tasmania. Although it is found all over Australia, it is not as common in Sydney as it once was (www.australianmuseum.net.au).	**Likely to Occur**. Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is approximately 1 km to the west (Arrow, 2024).
Spotted-tailed Quoll (southern)	*Dasyurus maculatus maculatus*	E	E	PMST, WildNet	The Spotted-tailed Quoll occurs along the east coast of Australia from south east Queensland to South Australia and Tasmania. The Spotted-tailed Quoll has been recorded in a wide range of habitat types including dry and moist sclerophyll forests and woodlands, rainforest, coastal heathland, and riparian forest. This species been occasionally sighted in treeless areas, rocky outcrops and grazing lands (NPWS, 1999; NPWS, 2000; Strahan, 2008). The Spotted-tailed Quoll shelters and dens in small caves, fallen logs with large hollows and tree hollows and may utilise numerous dens within its home range which has been estimated to be between 800 ha to 20 km2 (NPWS, 2000; NPWS in prep, 1999). The Spotted-tailed Quoll is partly arboreal and feeds upon a variety of prey species including birds, rodents, lizards, small wallabies, and even insects. The Spotted-tailed Quoll is also known to scavenge and feed upon carrion, road kills including wild dogs, and litter (Strahan 1998; NPWS 2000).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Yellow-bellied Glider	*Petaurus australis*	V	V	PMST	The Yellow-bellied Glider (south-eastern) is found at altitudes ranging from sea level to 1400m ASL and has a widespread but patch distribution from southeastern QLD to far southeastern SA, near the SA-VIC border. This distribution also extends inland to the western slopes of the Great Dividing Range in parts of NSW and QLD. The Yellow-bellied Glider occurs in eucalypt-dominated woodlands and forests, including both wet and dry sclerophyll forests. Their abundance is highly dependant on habitat suitability, which is in turn determined by forest age and floristics. This subspecies shows a preference for large patches of mature old growth forest that provide suitable trees for foraging and shelter. There is also a clear preference for forests with a high proportion of winter-flowering and smooth-barked eucalypts (which are a key foraging resource) (DAWE, 2022).	**Potential to Occur**. Suitable habitat for this species has been identified within the Study area, and nearby historical records have been identified. The nearest historical record is approximately 21 km to the south (ALA, 2008).
Fish Species						
Murray Cod	*Maccullochella peelii*	V	-	PMST	The Murray Cod was historically distributed throughout the Murray-Darling Basin, which extends from southern QLD, through NSW, the ACT and VIC to SA, with the exception of the upper reaches of some tributaries. This species still occurs in most parts of this natural distribution but to approximately 1000 m above sea level. The species' estimated extent of occurrence, based on areas with an average river width of 50 m, is 660 km2. This species utilises a diverse range of habitats from clear rocky streams, such as those found in the upper western slopes of NSW, to slow-flowing, turbid lowland rivers and billabongs (SPRAT, 2023).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Silver Perch	*Bidyanus bidyanus*	E	-	PMST, WildNet	The Silver perch are endemic to the Murray-Darling system (including all states and sub-basins). This species formerly utilised a diversity of habitats within the Murray-Darling system and are commonly described as a lowland species that are not found in the cooler upper reaches of rivers. However, numerous reliable accounts exist of Silver Perth penetrating to Cooma (~800 m ASL) on the Murrumbidgee River in large-scale upstream migrants in summer in the early and mid 1900s. This species is consistently reported by anglers and researches to show a general preference for fast-flowing water, including rapids and races, and more open sections of river, throughout the Murray-Darling Basin (SPRAT, 2023).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Invertebrate Species						

Common Name	Scientific Name	EPBC Status	NC Status	Source	Habitat Description	Likelihood of Occurrence
Brigalow Woodland Snail	*Adclarkia cameroni*	E	V	PMST, WildNet	The Brigalow woodland snail is endemic to south-east QLD, where is occurs in a small number of remnant and scattered Acacia harpophylla (brigalow) and eucalypt woodland patches (such as road verges and riparian corridors) on the Condamine River floodplain, especially in the area around Dalby and Chinchilla (Stanisic, 2011).	**Likely to Occur**. Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is approximately 5 km to the north-east (ALA, 2012).
Bulloak Jewel Butterfly	*Hypochrysops piceatus*	CE	CR	PMST	The Bulloak Jewel Butterfly is restricted to south-eastern QLD from near Leyburn to the Bendidee National Park/State Forest Area. Adults are active in warm, sunny conditions from late September to November. Males establish territories and settle above the ground at the edge or tops of mature Bulloak (Allocasuarina luehmannii). Larvae feed on A. luechmannii and are attended by arboreal ants (Anonychomyrma inclinata). The ants carry the larvae to and from shelters on the host tree between dusk and dawn to feed on the soft terminal foliage. Meanwhile, the ants attend and feed on secretions from the larvae, and in turn provides the larvae with protection from predators. The attendant ants are strictly arboreal and require canopy connectivity for dispersal, and mature trees where colonies can exist in hollow branches and trunks (Braby 2016)(SPRAT Profile).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Dulacca Woodland Snail	*Adclarkia dulacca*	E	E	PMST	Publicly available records suggest the Dulacca Woodland Snail is restricted to the southern Brigalow Belt between Miles, Dulacca, Wandoan and Meandarra, though recent work has found the species west to the Yuleba area and east to the Chinchilla area (Eddie 2023). It has been recorded from Gurulmundi State Forest to the north-west and at one location to the 16 km east of the Study area near Barakula State Forest in 2012. It has also been recorded at 2 locations on the Condamine River ("Sherwood"; ALA 2010). The species has been located in a variety of habitats including vine thicket and Brigalow woodand with rock outcrops and Lancewood, Ironbark and E. woollsiana on ridges with and without rock (TSSC, 2016b). It shelters in moist microhabitats under wood, rocks and other debris, as well as under bark at the base of trees. It has been found persisting in Brigalow regrowth but only where there is abundant suitable microhabitat (e.g. logs, dense leaf litter). This species can also shelter under loose bark at the base of trees (SPRAT, 2023). Eggs are laid in suitable microhabitat locations during summer rains.	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Pale Imperial Hairstreak	*Jalmenus eubulus*	-	V	WildNet	Jalmenus eubulus occurs in woodland and associated forest on alluvial plains dominated by stands of Brigalow (Acacia harpophylla) west of the GDR from central QLD to northern NSW. The species requires a mix of mature trees of the host plant where the attendant ants (Iridomyrmex sp.) exist in hollow branches, and low shrubs on which the larvae feed. Adults fly around or close to stands of the host plant, meanwhile the larvae feed on young leaves of A. harpophylla accompanied by attendant ants (Braby 2016).	**Likely to Occur**. Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is approximately 8 km to the north (ALA, 1988).
Reptile Species						
Adorned Delma	*Delma torquata*	V	V	PMST	Under rocks and in soil cracks on heavy, stony and lightly timbered soils near Kenmore, Brookfield and Mt Crosby. Endemic to South-east Queensland. Also found in numerous disturbed habitats throughout Southeast Queensland (Cogger 2000).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Bunya Sunskink	*Lampropholis colossus*	-	NT	WildNet	The Bunya Sunskink is endemic to the Bunya mountains where it has been found in rainforest margins, dry rainforests and in moist savannah woodlands containing rainforest elements at higher altitudes (Smith et al, 2015).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Common Death Adder	*Acanthophis antarcticus*	-	V	WildNet	The species is found in a wide variety of habitats in association with deep leaf litter, including rainforests, wet sclerophyll forests, woodland, grasslands, chenopod dominated shrublands, and coastal heathlands (DEHP 2017).	**Potential to Occur**. Whilst potentially suitable habitat for this species has been identified within the Study area, the nearest reliable record of this species was recorded at Lake Broadwater (approximately 7 km to the north) in 1984. Considering the age of this record and the absence of more recent records indicating that a local population may utilise this potential potential habitat, this species is considered to have a potential to occur within the Study area.
Condamine Earless Dragon	*Tympanocryptis condaminensis*	E	E	PMST, WildNet	The Condamine Earless Dragon occurs in the eastern Darling Downs region of south-east QLD, in the Brigalow Belt Sough IBRA bioregion. It occurs on the Condamine River floodplain in an area bounded by the Pirrinuan/Jimbour area in the northwest, Millmerran in the southwest, Clifton in the southeast and Toowoomba in the northeast. This species occurs in an area on black-cracking clays that is intensively cropped. Almost all records of this species have been made on one private property, along narrow road reserves or in headlands (thin, less than 10m wide strips of grassland on paddock verges). Vegetation where this species has been observed is cropped (on private property), and remnant native grassland and exotic grassland. The species has been found in cotton, sorghum, maize and sunflower crops. it is known to forage in stubble field and may benefit in areas where no-till farming is employed (SPRAT Profile).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.

Common Name	Scientific Name	EPBC Status	NC Status	Source	Habitat Description	Likelihood of Occurrence
Dunmall's Snake	*Furina dunmalli*	V	V	PMST, WildNet	The distribution of the Dunmall's Snake extends from near the QLD border through the Brigalow Belt South and Nandewar bioregions, as far south as Ashford in NSW. In QLD this species occurs primarily in the Brigalow Belt region in the south-eastern interior of QLD. Records indicate sites at elevations between 200-500 m above sea level. The snake is very rare of secretive with limited records existing. It has been recorded at Archokoora, Oakey, Miles, Glenmorgan, Wallaville, Gladstone, Lake Broadwater, Mount Archer, Exhibition Range National Park, roadside reserves between Inglewood and Texas, Rosedale, Yeppoon and Lake Broadwater Conservation Park. It has been found in a broad range of habitats including forests and woodlands on black alluvial cracking clay and clay loams dominated by Brigalow; and other various Blue Spotted Gum, Ironbark, White Cypress and Bulloak open forests and woodland associations on sandstone derived soils (SPRAT).	**Potential to Occur**. Whilst potentially suitable habitat for this species has been identified within the Study area, the nearest reliable record of this species was recorded approximately 21 km to the southwest (ALA, 2021). There is a record from 1984 at Lake Broadwater (approximately 7 km to the north), however the age of this record indicates it may not be reliable. Therefore, this species is considered to have a potential to occur within the Study area.
Five-clawed Worm-skink	*Anomalopus mackayi*	V	E	PMST, WildNet	The distribution of the Five-clawed Worm Skink is patchy in north-eastern NSE and south-eastern QLD. In south-eastern QLD the species is known from the upper Condamine River Floodplain from Warwick in the south to the Jimbour region in the north and bordered by the western edge of the Granite Belt. This species occurs in Bluegrass and/or Mitchell Grass dominated grasslands or mixed grasslands dominated by other grass species, but still categorised as Re 11.3.21. In south-east QLD, the species may also occur in River Red Gum/Queensland Blue Gum/Coolibah/Poplar Box grassy woodland/open forest communities. The species is not likely to be found in soils in which deep cracks do not form, such as hard-setting brown clays or sandy soils (SPRAT, 2022).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Golden-tailed Gecko	*Strophurus taenicauda*	-	NT	WildNet	The Golden-tailed Gecko is only found in the Brigalow Belt North and Brigalow Belt South bioregions of QLD and NSW. This is a mostly arboreal nocturnal species that feeds on a variety of insects and other invertebrates. It occupies a range of vegetation types, particularly where Acacia harpophylla, Casuarina cristata, Allocasuarina luehmannii, Eucalyptus crebra and callitris glaucophylla are growing (Pavey et al. 2021).	**Likely to Occur**. Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is less than 1 km to the east (Arrow, 2012).
Grey Snake	*Hemiaspis damelii*	E	E	PMST, WildNet	Queensland, records are known from near Goondiwindi and the adjacent Darling-Riverine Plain, from the Darling Downs and from the Lockyer Valley. Several isolated records also occur in the Rockhampton area. It favours woodlands, usually on heavier, cracking clay soils, particularly in association with water bodies. They shelter under rocks, logs and other debris as well as in soil cracks (SPRAT 2011).	**Likely to Occur**. Suitable habitat has been identified within the Study area and nearby historical records have been identified. The nearest record is approximately 5 km to the east (Arrow, 2024).
Woma	*Aspidites ramsayi*	-	NT	WildNet	The Woma python can be found in the west and centre of Australia from WA through southern NW and northern SA to southern QLD and northwestern NSW. Its range may be discontinuous. This species was previously common on sandplains with other populations in the south and east found amongst wheatbelt and goldfield areas (www.ala.org.au). This species can be found in woodlands, heaths and shrublabds, often with spinifex (Wilson, S and Swan, G, 2017). They have been known to shelter in abandoned monitor and mammal burrows and in soil cracks.	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Yakka Skink	*Egernia rugosa*	V	V	PMST, WildNet	Endemic to Queensland where its distribution is highly fragmented. Microhabitat requirements include partly buried rocks, logs or tree stumps, root cavities and abandoned animal burrows in association with dry sclerophyll forest or woodland, brigalow forest and open shrubland (Cogger 2018; McDonald 2008). It is also known to excavate deep burrow systems. The Yakka Skink can persist in cleared habitats if shelter sites such as raked log piles, deep gullies, tunnel erosion/sinkholes and rabbit warrens are available (DEHP 2017). The species can occur on a wide variety of Queensland RE Land Zones including LZs 3, 4, 5, 7, 9 and 10 (DoE 2024) and in addition to the microhabitat features mentioned above, a 50% (combined) cover of native grasses and shrubs understory to 1m tall is indicative of suitable habitat (DSEWPC 2011).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded.
Plant Species						
Hando's Wattle	*Acacia handonis*	V	V	PMST, WildNet	Inhabits gently undulating slopes and stony ridges with laterite soils. Associated vegetation includes open forest or woodland with varying density of understory. Associated species include Eucalyptus fibrosa subsp. nubila, Corymbia watsoniana subsp. watsoniana, Lysicarpus angustifolius, and Allocasuarina inophloia (Halford, 1995a). Other wattles growing in the area include Acacia conferta, A. complanata, A. julifera and A. juncifolia (Hando, 2007). Associated understorey species include Dodonaea falcata, Boronia bipinnata, B. glabra, Cleistochloa subjuncea, Entolasia stricta, Schoenus kennyi, Triodia scariosa subsp. yelarbonensis, and Lomandra multiflora subsp. multiflora (SPRAT Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area. The Study area is also outside the known distribution of this species.
Tara Wattle	*Acacia lauta*	V	V	PMST, WildNet	Localities are characterized by a gently undulating to flat landforms. Soils are moderately deep and hard setting with a weakly acidic to neutral sandy loam surface grading into neutral to alkaline sandy clay subsoil. The vegetation varies from open forest to low woodland with a dense or moderately dense shrub layer. Tree species present at all sites include Callitris glaucophylla (White Cypress Pine) and Allocasuarina luehmannii (Buloke) (SPRAT Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Acacia wardellii	-	NT	WildNet	Acacia wardellii is known from south of Roma, south-west of Chinchilla and the Thomby Range in south-east QLD. In the Thomby Range, the species has been collected near Rocky Glen Homestead, Glenmore in the Silver Springs Gas Field, and in an area ranging from 15 km east-north-east to 15 km east-south-east of Condamine. It has also been collected 16 km west of Inniscraig Homestead south of Roma, near Binjour south-east of Eidsvold and Rockwood Station, 36 km south-east of Chinchilla. This species grows in gravelly soil on shallow weathered sandstone in eucalypt woodland and has been recorded from disturbed and recently burnt areas. The species has been described from tall open forest with Corymbia trachyphloia, C. intermedia, Eucalyptus major, E. cloeziana with a sparse Allocasuarina torulosa shrub layer (QLD - Species Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.

Common Name	Scientific Name	EPBC Status	NC Status	Source	Habitat Description	Likelihood of Occurrence
	Androcalva procumbens	V	-	PMST	Androcalva procumbens is endemic to NSW and is known from the Dubbo-Medooran-Gilgandra region, the Cobar region, and the upper hunter Valley. Populations of this species have been recorded in Goonoo State Forest, Mt Kaputar National Park, and Pilliga Nature Reserve and other populations occur on crown land, state forests and on private land. This species occurs in sandy soils, often in disturbed habitats such as road verges, quarry boundaries, gravel stockpiles, and power line easements. It is often found in communities of Eucalyptus dealbata/E. sideroxylon woodland, Memaleuca uncinata shrubland, and mallee eucalypt and Calytrix teragona understory (SPRAT Profile).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Hairy-joint Grass	*Arthraxon hispidus*	V	V	PMST	In NSW and QLD, this species is found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps, as well as woodland. In the SE QLD Bioregion, A. hispidus has also been recorded growing around freshwater springs on coastal foreshore dunes, in shaded small gullies, on creek banks, and on sandy alluvium in creek beds in open forests, and also with bog mosses in mound springs (QLD - Species Profile)	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded.
Bunya Mountains Bluegrass	*Bothriochloa bunyensis*	V	V	WildNet	The Three-leaved Bosistoa is found from the Nightcap Range north of Lismore in NW NSW to Mount Larcom in SW QLD. The species is described in herbarium collection records as locally abundant at Natural bridge-Sptingbrook NP and Coalstoun Lakes NP in QLD. This species grows in lowland subtropical rainforest up to 300m above sea level (SPRAT Profile).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Ooline	*Cadellia pentastylis*	V	V	PMST, WildNet	Ooline occurs on the north-west slopes of NSW and in central and southern QLD where it is found within the 500 mm and 750 mm rainfall isohyets. This species is of considerable biogeographic interest as it is a relic of an extensive rainforest vegetation that covered much of Australia in the past. This species grows in semi-evergreen vine thickets and sclerophyll vegetation on undulating terrain of various geology, including sandstone, conglomerate and claystone. It forms a closed or open canopy, as a dominant or commonly with White Box and White Cypress Pine, with an open understory and leaf litter dominating the forest floor (SPRAT Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Bailey's Cypress	*Callitris baileyi*	-	NT	WildNet	Callitris baileyi is found sporadically throughout south-east Queensland, from the state border to Coomeri in the north and west to the Bunya Mountains. A small population exists in north-eastern New South Wales, near the Queensland border. This species grows on rocky slopes, hills or mountainous areas, in shallow and often clay soils. It is found in eucalypt woodland, commonly associated with ironbark, blue gum and spotted gum. The NSW population occurs in an open grassy eucalypt forest near a creek (QLD - Species Profile).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
	Calyptochloa gracillima subsp. ipsviciensis	-	CR	WildNet	Calyptochloa gracillima subsp. ipsviciensis is endemic to southeast QLD in the vicinity of Ipswich where it is known from a few small areas. It is an uncommon to dominant species in woodlands dominated by Eucalyptus spp. Including E. crebra and E. moluccana and/or Corymbia citridora on loam to clay loam duplex soils derived from shale on gently undulating to hilly terrain. Res represented include 12.9-10.2, 12.9-10.3 and 12.9-10.19. Associated ground layer species include Aristida caput-medusae, Cleistochloa subjuncea and Themeda triandra. The habitat is typically moderately shaded (Grasses of Australia).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
	Camptacra perdita	-	E	WildNet	Camptacra perdita is known from four collections in southern QLD (two from near Oakey, 1 near St George and one near Roma), and from a single location in NSW. It is recorded growing in grassland on heavy black soil on alluvial, at least two sites dominated by Dichanthium sericeum. This species typically grows in grasslands on fertile cracking clays and is therefore threatened by cropping and grazing activities (Bean, A.R. 2020).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Stream Clematis	*Clematis fawcettii*	V	V	PMST, WildNet	Clematis fawcettii is endemic to Australia where its range extends from the Bunya Mountains in QLD to Lismore in NSW. This species occurs most commonly in the canopy gaps of drier rainforests near streams where it has been recorded in; semi-evergreen vine thickets, araucarian microphyll vine forests, occasionally in complex notophyll vine forests and occasionally in eucalypt woodland communities that are close to vine thickets or rainforests (SPRAT Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area. The Study area is also outside the known distribution of this species.
Gorge Laurel	*Cryptocarya floydii*	-	NT	WildNet	Gorge Laurel grows in drier rainforest, utually in rocky areas, at altitudes between 300 and 1,050m between the Bunya Mountains in southern QLD and Wollomombi Falls in northern NSW (www.ala.org.au).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
	Cymbonotus maidenii	-	E	WildNet	Cymbonotus maidenii occurs on open grassland, along roadsides or beside watercourses. It grows on black, brown or grey heavy, cracking clay soils (QLD - Species Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Cyperus clarus	-	V	WildNet	Cyperus clarus grows in grassland or open woodland in heavy soils derived from basalt. This species is associated with grasslands where Aristida leptopoda and Panicum queenslandicum occur on deep alluvial black clay; in Eucalyptus melanophloia woodland with mid-dense ground stratum of Chrysopogon fallax; growing with Stemmacantha australis in mountain coolibah woodland on basalt ridges; and in Dichanthium grassland with Cyperus bifax and Fimbristylls spp (QLD - Species Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Denhamia parvifolia	V	V	WildNet	Denhamia parvifolia occurs from Eidsvold to Kingaroy, and near Chinchilla. The species occurs within Allies Creek State Forest and Koko State Forest. This species is found in vine forests and semi-evergreen vine thickets, commonly on basalt-derived, brown or red soils above 300m in altitude. It is also occasionally found in ecotone areas with open forests (QLD - Species Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.

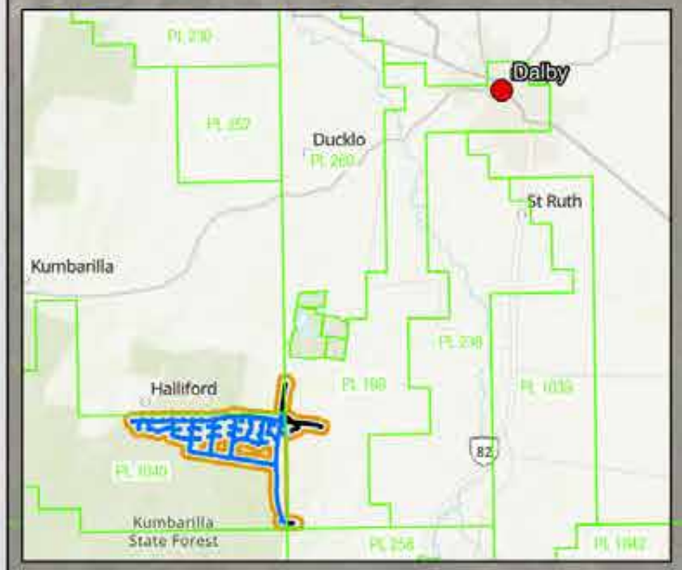
Common Name	Scientific Name	EPBC Status	NC Status	Source	Habitat Description	Likelihood of Occurrence
King Blue-grass	*Dichanthium queenslandicum*	E	V	PMST, WildNet	King Blue-grass is endemic to central and southern QLD where it occurs in three disjunct populations including: Hughenden district; from Nebo to Monto and west to Clermont and Rolleston; and Dalby district. Its extent of occurrence has reduced from 1100 km2 to 245 km2. Its area of occupancy is unknown, but based on the extent of occurrence it is likely to be restricted. This species occurs within the South Eastern QLD, Brigalow Belt South, Brigalow Belt North, Central Mackay Coast, Desert Uplands, Mitchell Grass Downs and Einasleigh Uplands Bioregions. The distribution of this species overlaps with several EPBC listed Threatened Ecological Communities. This species occurs on black cracking clay in tussock grasslands mainly in association with other species of blue grasses but also with other grasses restricted to this soil type. This species is mostly confined to natural grassland on the heavy black clay soils on undulating plains (SPRAT Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Bluegrass	*Dichanthium setosum*	V	-	PMST	Dichanthium setosum has been reported from inland NSW to QLD. There are also reports from WA and TAS. The species is associated with heavy basaltic black soils and red-brown loams with clay subsoils (predominantly cracking clays or alluvium, often in gilgai). It is often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture. The species may tolerate or benefit from disturbance, otherwise, disturbance is indicative of threatening processes in its habitat (SPRAT Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Digitaria porrecta	-	NT	WildNet	Digitaria porrecta occurs in four disjunct areas extending over 1000km. In QLD, it occurs in the Nebo district, south-west of Mackay; the Central Highlands between Springsure and Rolleston; and from Jandowae south to Warwick (41 sites). This species is endemic to eastern Australia in QLD and NSW where it occurs in several disjunct population centres with appropriate heavy soils. In QD these localities are all within the Brigalow Belt Bioregion. The species occurs in tussock grassland or open woodland of poplar box of forest red gum, invariably on heavy, cracking clays, sometimes of alluvial origin (QLD - Species Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area. The Study area is also outside the known distribution of this species.
	Diuris parvipetala	-	V	WildNet	Diuris parvipetala grows among grass in open forests, on ridges and gentle to steep slopes, among basalt boulders and on granite pavements. It grows in shallow, brown, basalt loam soils (QLD - Species Profile).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded.
Queensland White Gum	*Eucalyptus argophloia*	V	CR	PMST, WildNet	Eucalyptus argophloia occurs on flat to undulating country at 300 - 340 m above sea level. It prefers deep, dark, heavy clay soils, often with strong gilgai development. It has been recorded growing in brigalow woodland and forest communities associated with Belah, Poplar Box and Inland Grey Box (www.wetlandinfo.des.qld.gov.au)	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Plunkett Mallee	*Eucalyptus curtisii*	-	NT	WildNet	Eucalyptus curtisii has two growth forms that occur in different habitats. The shorter mallee form is more likely to occur as the only eucalypt species on poorly drained lowland sites in shrubland dominated by banksia, with an understorey of heath plants, and sometimes E. conglomerata may also be present. The larger growth form occurs as scattered individuals on better drained soils in the more open areas of mixed eucalypt forests. Commonly associated species include Corymbia citriodora subsp. variegata, C. trachyphloia and Callitris endlicheri, less commonly associated with E. fibrosa, E. planchoniana and E. acmenoides. E. curtisii occurs on sandy podsoils with impeded drainage, shallow stony soils, clay loams and stony clays with a surface layer of loose stones (www.wetlandinfo.des.qld.gov.au).	**Potential to Occur.** Suitable habitat for this species which includes mixed eucalypt forests, is likely to occur within the Study area. Several nearby records have been identified to the north of Braemar State Forest and to the west of Dalby State Forest.
	Eucalyptus virens	V	V	PMST, WildNet	Eucalyptus virens has a very limited distribution in southern Queensland and is currently known from 5 locations scatters over a distance of approximately 500km. Locations include near Inglewood, Tara, north-east of Eidsvold and the scarp on approach to the Maranoa River near Mt Moffatt, 10km east-south-east of Brovinia, north of Binjour and north-west of Injune. This species occurs on sandy soils on low rises, hillslopes, sandstone escarpments and scree slopes. This species grows in woodland communities (QLD - Species Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Fimbristylis vagans	-	E	WildNet	This Queensland endemic is restricted to the Darling Downs between Lake Broadwater and Nudley Creek (30km NE of Chinchilla) (DEHP 2013). The species occupies habitat fringing ephermeral watercourses and lagoons on alluvium, typically RE 11.3.2, 11.3.4, 11.3.14, 11.3.26 and 11.3.27. The species is not known to be associated with non-remnant habitats.	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Haloragis exalata subsp. velutina	V	V	WildNet	Haloragis exalata subsp. Velutina occurs in south-east QLD, from Brisbane west to the Bunya Mountains, with an isolated occurrence in Carnarvon National Park. This species is locally common in some areas such as Bunya Mountains NP, but is often recorded in low numbers. This species occurs within the Bunya Mountains NP, D'Aguilar NP, Deer Reserve NP and Yarraman State Forest. This species has been recorded from eucalypt forests from rainforest margins and grasslands from near sea-level to 1000m. They have been recorded growing on brown heavy clay, shallow rock loam and basaltic soils. They are commonly associated with Eucalyptus tereticornis, Angophora subvelutina and Acacia irrorata (QLD - Species Profile).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded.
Belson's Panic	*Homopholis belsonii*	V	E	PMST, WildNet	Homopholis belsonii's distributional range lies within the Brigalow belt QLD, namely the Darling Downs area west of Toowoomba, near Oakey, Jondaryan, Bowenville, etc. The species is also found on the northwest slopes and plains of NSW, north of Warialdra. This grass species is found on poor soils in dry woodlands and at elevations of 200-520 m in NSW and 342-500 in QLD. There are three general types of habitat which support this species a) Rocky, basaltic hills; b) flat to gently undulating alluvial areas; and c) drainage lines. This species is commonly found amongst fallen timber, at the base of trees and shrubs, among branches and leaves of trees hanging low and around fence lines. It is believed to be shade dependent as it almost always occurs in these types of areas (SPRAT Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Homoranthus decumbens	E	V	PMST	Homoranthus decumberis occurs in QLD where it is restricted to Barakula State Forest near Chinchilla. This population consists of approximately 50 plants. This species occurs on flat country on deep sandy soils with lateritic pebbles, in heath and shrubby woodland. Regional Ecosystems likely to support this species include 11.7.5, 11.7.5a, 11.7.5b and 11.5.21 (SPRAT Profile).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded.
	Lagenophora fimbriata	-	V	WildNet	Lagenophora fimbriata is endemic to south-east QLD, extending from near Cracow to Inglewood, and east to Jimboomba. It inhabits heavy clay soils in flat or gently undulating terrain, in communities dominated by Acacia harpophylla and Casuarina cristata, or Eucalyptus moluccana or Melaleuca irbyana (Wang and Bean 2016).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded.

Common Name	Scientific Name	EPBC Status	NC Status	Source	Habitat Description	Likelihood of Occurrence
Winged Pepper-cress	*Lepidium monoplocoides*	E	-	PMST	Lepidium monoplocoides is widely distributed on the inland plains of south-eastern Australia, occurring from northern NSW to western Victoria, with an old record from south-eastern SA. The species occurs in the Murray Darling Depression, Diverina, Darling Riverine Plains and Cobar Peneplain Bioregions. This species occurs in open, sparsely vegetated sites in a range of habitats on heavy clay or clay-loam soils, usually on sites that are seasonally flooded or prone to waterlogging, in arid to semi-arid areas with an average rainfall range of 200-450 mm per year. Vegetation communities in which the species occurs include grasslands, wetlands and floodplain woodlands dominated by Eucalyptus coolabah and Eucalyptus largiflorens, and chenopod shrublands dominated by Atriplex, Maireana and/or Nitraria species. Locations where this species occurs tend to be ephemeral, and it may be an opportunistic species able to take advantage of seasonally available habitat (National Recovery Plan).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Austral Cornflower	*Leuzea australis*	V	V	PMST, WildNet	The Austral Cornflower is currently confined to Queensland. The species was known to previously occur in NSW and VIC, but is now presumed extinct in those locations (2008). The current distribution of the Austral Cornflower extends from Allora (north of Warwick) to Callide (north-west of Biloela), QLD. This species usually grows on heavy black or red-brown clay, or clay loams derived from basalt. Populations are often confined to roadsides and cultivation headlands. Locations where the species occurs range in altitude up to 480 m above sea level. The species is often found in woodland and grassland and in association with Eucalyptus crebra, E. Orgadophila, E. populnea, E. tereticornis, E. melanophloia, Angophora subcelutina, A. floribunda, Dichanthium sericeum and Themeda triandra (SPRAT, 2019).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
	Macrozamia machinii	V	V	PMST	Macrozamia machinii occurs on the Darling Downs in QLD between Texas and Wondul Range National Park where it has been identified from 8 populations near Inglegood. This species occurs in deep sandy soils in flat areas of open forests dominated by Angophora leiocarpa, Allocasuarina inophloa, White Cypress-pine, Budgeroo and Crowded-leaf Wattle. One population also occurs on a red lateritic ridge with Black Cypress-pine, Timbledown Ironbark and Western Yellow Stringybark. This species is found at altitudes from 320-460m (SPRAT, 2022).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded.
Gurulmundi Heath-myrtle	*Micromyrtus carinata*	-	E	WildNet	Micromyrtus carinata is endemic to a small area to the north-west of Gurulmundi, on the crest of the Great Diving Range. The species occurs east of Chinchilla and north-west of Miles (occurs within the Gurulmundi State Forest). This species inhabits the tops of laterised ridges, on shallow to deep, yellow or red sands (QLD - Species Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Philotheca sporadica	-	NT	WildNet	Philotheca sporadica is known from the south-east QLD just north of Tara to approximately 12 km east of Kogan in the Darling Downs Pastoral District. In 1995 the QLD herbarium had recorded 11 populations and at least four have subsequently included. Within the Condamine River catchment this species occurs on soils derived from low fertility laterised Cretaceous sandstones in undulating to flat top or rounded hills. It is associated with open shrubland to closed shrubland to closed woodland dominated by Allocasuarina inophloia, Angophora leiocarpa, Callistris endlicheri, Callistris glaucophylla, Eucalyptus crebra, Corymbia watsoniana, Eucalyptus exerta, Eucalyptus fibrosa, E. fibrosa subsp. nubillis and Lysicarpus angustifolius (SPRAT, 2022).	**Known to Occur**. Suitable habitat has been identified within the Study area and nearby historical records have been identified within the Study area (Arrow, 2024).
	Picris barbarorum	-	V	WildNet	Picris barbarorum is found in Queensland and New South Wales along riverbanks and floodplains on heavier alluvial soils. It is also known in Victoria by 3 old collections. The lack of any recent collections would suggest that the species is either extremely rare or extinct in VIC (Vicflora).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
Hawkweed	*Picris evae*	V	V	PMST, WildNet	Picris evae occurs north of the Inverell area in NSW and has been collected at Elsmore, Oxley Park, and Dangars Falls in Oxley Wild Rivers National Park in the NSW northern tablelands. In QLD, this species occurs at 30 sites in the Darling Downs and Moreton pastoral districts in the south-east. This species occurs in Eucalyptus open woodland with a grassy understory composed of Dichanthium spp. Upper stratum species include Eucalyptus melliodora, E. crebra, E. populnea, E. albens, Angophora subvelutina, Allocasuarina torulosa, and Casuarina cunninghamiana. Collections have been made along roadsides and in cultivated areas such as paddocks, on black, dark grey or red-brown soils, reddish clay-loam or medium clay soils. The distribution of this species overlaps with several EPBC listed TEC's (SPRAT).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
	Polianthion minutiflorum	V	V	PMST, WildNet	Polianthion minutiflorum is known from Redcliffe vale, about 110 km west of Mackay, south to Kingaroy, covering a distance of approximately 800 km. This species is usually found in forest and woodland on sandstone slopes and gullies with skeletal soil, or sometimes deeper sands adjacent to deeply weathered laterite (www.des.qld.gov.au/species-search).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded.
	Pomaderris coomingalensis	-	E	WildNet	Pomaderris coomingalensis has been collected from the Coominglah State Forest between Monto and Theodore. There are also collections from near Kingaroy, Proston and Dalby where it is described as being locally common. The species occurs within Braemar State Forest, Coominglah State Forest, Devine State Forest and Durikai State Forest. It is found within Eucalyptus decorticans, and Corymbia citriodora subsp. variegata open forest on red soil; and E. crebra / Eucalyptus fibrosa subsp. nubila woodland on stony brown clay loam (QLD - Species Profile).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Prostanthera sp. (Dunmore D.M.Gordon 8A)	V	V	PMST, WildNet	Prostanthera sp. Dunmore (D.M.Gordon 8A) is known from 4 locations in a small area west of Millmerran in southern QLD. Its extent of occurrence is less than 100 km2. One population occurs on private land and 3 in state forest, including one on the border with Wondul Range National Park. It grows in Eucalypt and Callitris woodland in shallow sandy soil or Eucalyptus woodland on hard sandstone ridge tops. The three populations in state forest occur in remnant vegetation (SPRAT Profile).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby recent historical records have been recorded. The Study area is also outside the known distribution of this species.
Rib-fruited Malletwood	*Rhodamnia dumicola*	-	E	WildNet	Whilst there is little habitat information available for the Rib-fruited Mallewood, local records are all located within Araucarian complex microphyll to notophyll vine forests or cleared areas within the Bulburin National Park (no reference).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded.

Common Name	Scientific Name	EPBC Status	NC Status	Source	Habitat Description	Likelihood of Occurrence
	Rutidosis glandulosa	-	NT	WildNet	Rutidosis glandulosa is known from approximately 15 populations across 6 distinct localities. This species occurs as far north as the Blackdown Tableland national Park, where 5 populations have been recorded. There is also one population just south on the Planet Downs Pastoral Holding. Other locations include Carnarvon Gorge National Park and just south on the Carnarvon Range, Gwambagwine, Barakula State Forest and Thulimbah. This species generally occurs on sandy or gravelly well drained soil in grassy open eucalypt woodland. Around Blackdown National Park, this species was observed growing in open forest dominated by Eucalyptus interstans, E. sphaerocarpa and Angophora leiocarpa. It has also been recorded in dense woodland, within spinifex heathland and open forests dominated by Corymbia citriodora, Eucalyptus crebra, Allocasuarina luehmannii with herby understories (QLD - Species Profile).	**Likely to Occur.** Potentially suitable habitat has been identified within the Study area, and nearby records have been observed. The closest record is located approximately 1 km to the west (Arrow, 2024).
	Rutidosis lanata	-	NT	WildNet	Rutidosis lanata is restricted to western Darling Downs from north of Jackson to south of Hannaford, southeast QLD. A recent intensive survey of the area has recorded the species at only two of the five localities, near Meandarra and north of Jackson. This species occurs at altitudes of 280-320 m ASL in open eucalypt forests and woodlands including Eucalyptus populnea-Casuarina cristata forest, ironbark and Acacia sparsiflora forest, box ironwood forest, and E. populnea woodland with Eremophile mitchellii. It has been recorded growing on flat land or stony red ridges in red-brown gravelly sands, grey clays, red-brown clay or sandy loams (QLD - Species Profile).	**Likely to Occur.** Potentially suitable habitat has been identified within the Study area, and a nearby record has been observed. This record was observed within the Study area as part of consolidated survey efforts across the broader SGP Project (Arrow, 2024).
	Solanum papaverifolium	-	E	WildNet	This species occurs predominantly in the Darling Down District of south-eastern Queensland and the Northern Slopes District of New South Wales. It is generally found on heavy clay in grassland or eucalypt woodland. This species flowers October to March and fruits from November to April (www.flora.sa.gov.au).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Solanum stenopterum	-	E	WildNet	Solanum stenopterum is patchily distributed across the Darling Downs in QLD from Gayndah south to Goondiwindi, west to Jackson and east to Oakey. It inhabits grassland or woodlands of belah and poplar box on black, brown or red clay loam soils. It also grows on loamy ridges, along roadsides and in paddocks (www.des.qld.gov.au/species-search).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Sophora fraseri	V	V	PMST	This species is widespread but not common through south-east Queensland. It grows in moist habitats, often in hilly terrain at altitudes from 60-660 m on shallow soils along rainforest margins in eucalypt forests or in large canopy gaps in closed forest communities (Conservation Advice 2008 - EPBC).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.
Austral Toadflax	*Thesium australe*	V	V	PMST, WildNet	Austral Toadflax occurs in NSW, ACT, QLD and CIV. Its current distribution is sporadic but widespread, occurring between the Bunya Mountains in SE QLD to NE VIC, and as far inland as the southern, central and northern tablelands in NSW and the Toowoomba region. It is a semi-parasitic species found on roots of a range of grass species, notably Kangaroo Grass. It occurs in subtropical, temperate and subalpine climates over a wide range of altitudes. It occurs on soils derived from sedimentary, igneous and metamorphic geology on a range of soils including black clay loams to yellow podzolics and peaty loams. It occurs in shrubland, grassland or woodland, often in damp sites (SPRAT 2018).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Vincetoxicum forsteri	E	E	PMST	Vincetoxicum forsteri has rarely been collected and is known from eight localities in the Dubbo area and Mt Crow near Barraba in NSW, and "Myall Park" near Glenmorgan in QLD. This species is also conserved within Goobang National Park, Eura State Forest, Goonoo State Forest, Pilliga West State Forest and Coolbaggie Nature Reserve. This species grows in dry scrub, open forest and woodlands and overlaps with the distribution of the Brigalow and White Box-Yellow Box-Blakely's Red Gum Threatened Ecological Communities (Approved Conservation Advice, 2008).	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded.
	Westringia parvifolia	V	V	PMST, WildNet	Westringia parvifolia is known from four collections near Yelarbon, Inglewood and Woondiwindi in south-west QLD and from near Yetman in northern NSW. This species grows with Baker's Mallee (Eucalyptus bakeri) and Green Malle (E. viridis) and between clumps of Spinifex on sandy and stony soils (SPRAT, 2022).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Xerothamnella herbacea	E	E	PMST, WildNet	Xerothamnella herbacea is known from two sites north-east of Chinchilla, a single record from near Theodore and a record near Yelarbon east of Goondiwindi, QLD. This species occurs in Brigalow dominated communities in shaded situations, often in leaf litter and is associated with gilgais (SPRAT, 2022).	**Unlikely to Occur**. Whilst nearby historical records have been identified, no suitable habitat for this species has been identified within the Study area.
	Zieria obovata	V	V	WildNet	Zieria obovata is known only from Wild River Gorge, near Herberton and at Stannery Hills in north-eastern QLD. At the Wild River Gorge site, this species is found growing out of the granite rock face, in skeletal sandy soil associated with low cliff-side shrubs and also grows as an understory shrub in eucalypt open forest near the Gorge (SPRAT, 2020)	**Unlikely to Occur**. No suitable habitat has been identified in the Study area, and no nearby historical records have been recorded. The Study area is also outside the known distribution of this species.

Appendix E

Ecological Field Survey (EFS) sheets



Supplementary Data
500 m buffer
PL1040 - Proposed disturbance area

Ecology Assessment
Quaternary
Secondary

PL1040 - Tetris

Source: Arrow Energy Pty Ltd
Geoscience Australia
Dept. Natural Resources and Mines

1.1 0.6 0 1.1 km

Scale: 1:64,323 **@ A3**

N

arrow energy
go further

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The dimensions, areas, number of lots, size & location of corridor information are approximate only and may vary.

Date: 24/10/2024 **Author:** Thiago Moura
Issued To: Department of Environment, Science and Innovation (DESI)

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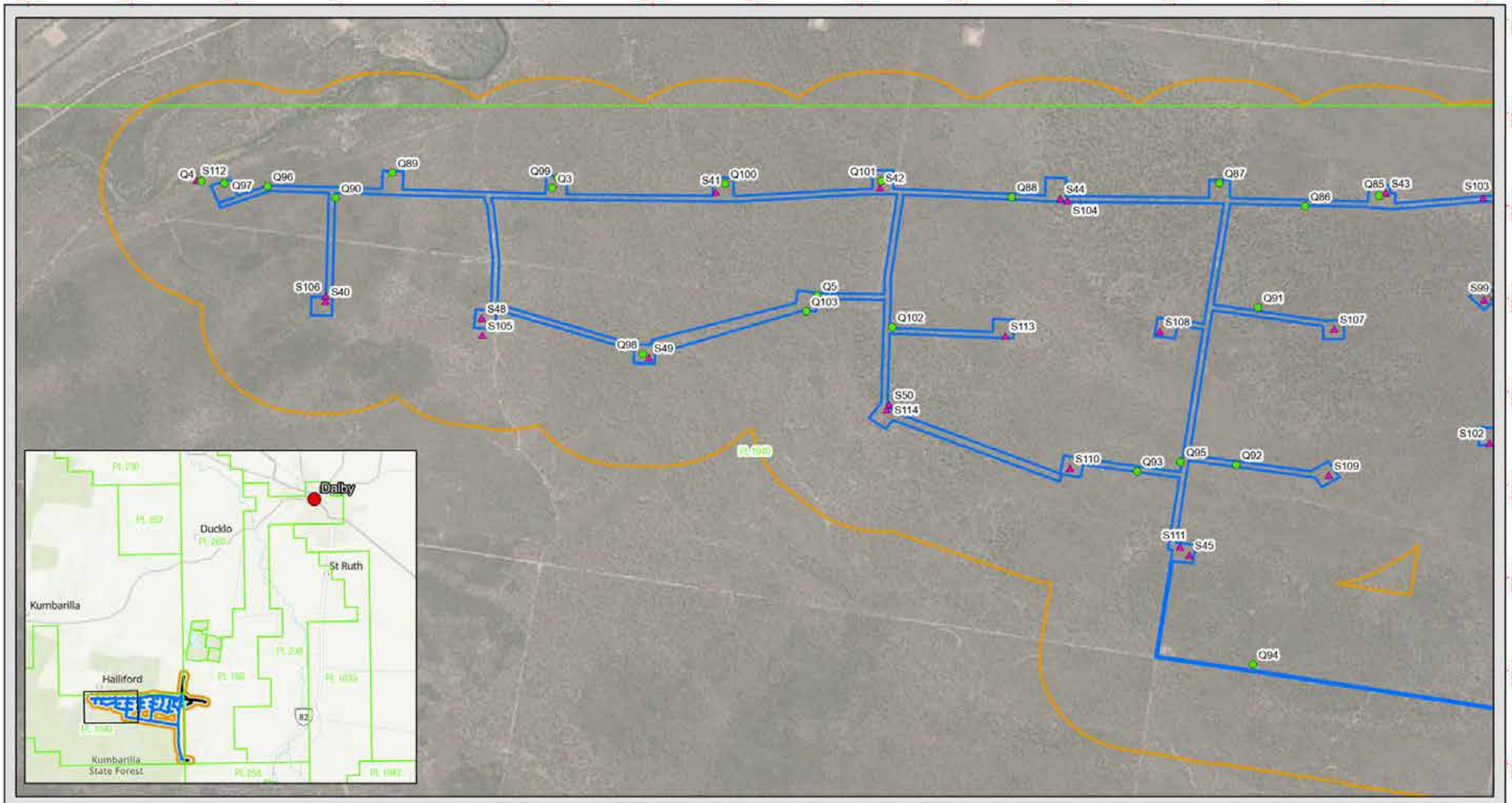

Supplementary Data

500 m buffer

PL1040 - Proposed disturbance area

Ecology Assessment

Quaternary

Secondary

PL1040 - Tetris

Source: Arrow Energy Pty Ltd
Geoscience Australia
Dept. Natural Resources and Mines

1.1 0.6 0 1.1 km

Scale: 1:20,000 **@ A3**

N

arrow energy go further

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Supplementary Data
500 m buffer
PL1040 - Proposed disturbance area

Ecology Assessment
Quaternary
Secondary

PL1040 - Tetris

Source: Arrow Energy Pty Ltd
Geoscience Australia
Dept. Natural Resources and Mines

1.1 0.6 0 1.1 km

Scale: 1:20,000 **@ A3**

N

arrow energy go further

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The dimensions, areas, number of lots, size & location of corridor information are approximate only and may vary.

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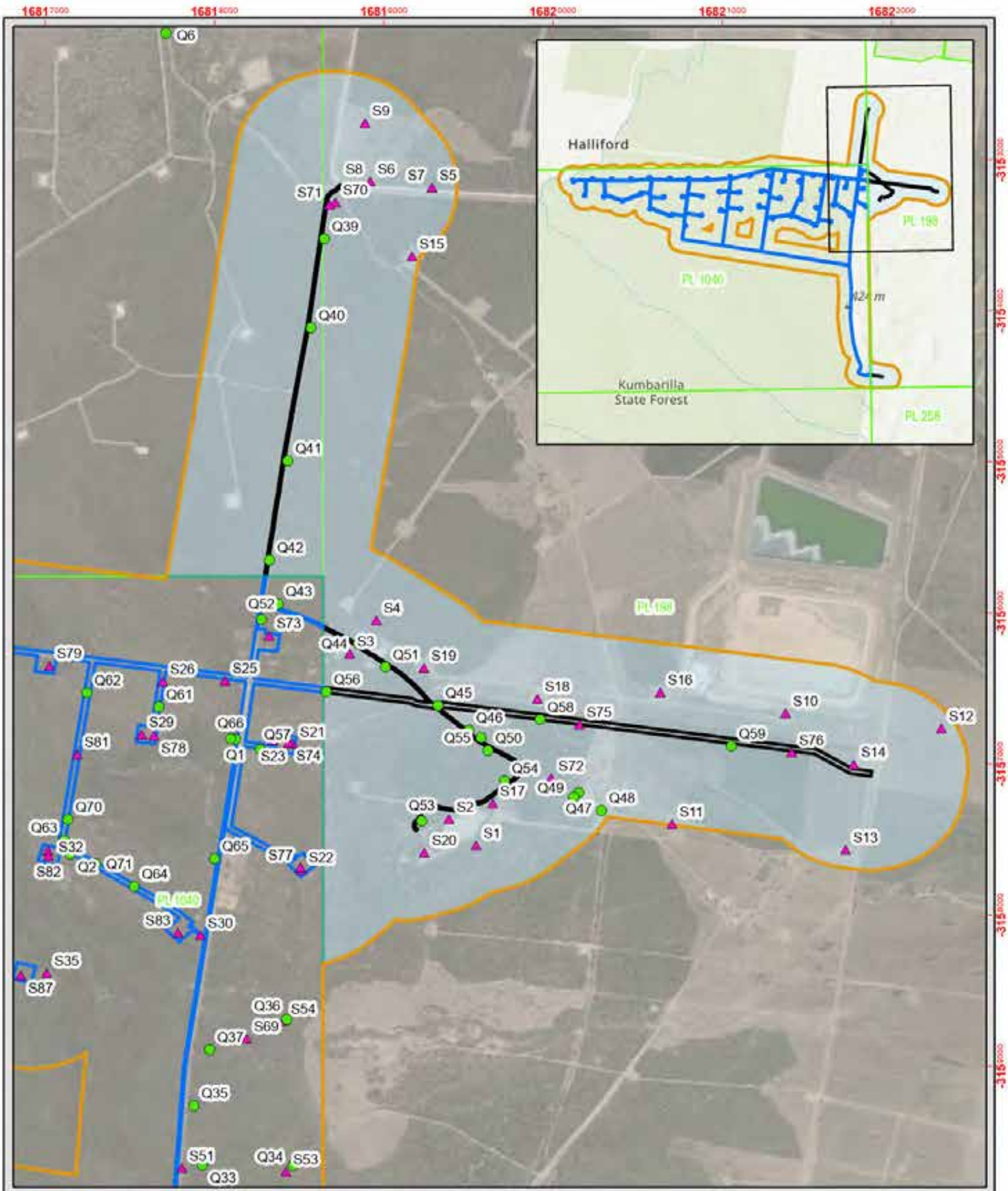

PL1040 - Tetris

Supplementary Data

500 m buffer

PL1040 - Proposed disturbance area

Ecology Assessment

Quaternary

Secondary

Source: Arrow Energy Pty Ltd
Geoscience Australia
Dept. Natural Resources and Mines

1.7 0.8 0 1.7 km

Scale: 1:59,000 @ A3

arrow energy
go further

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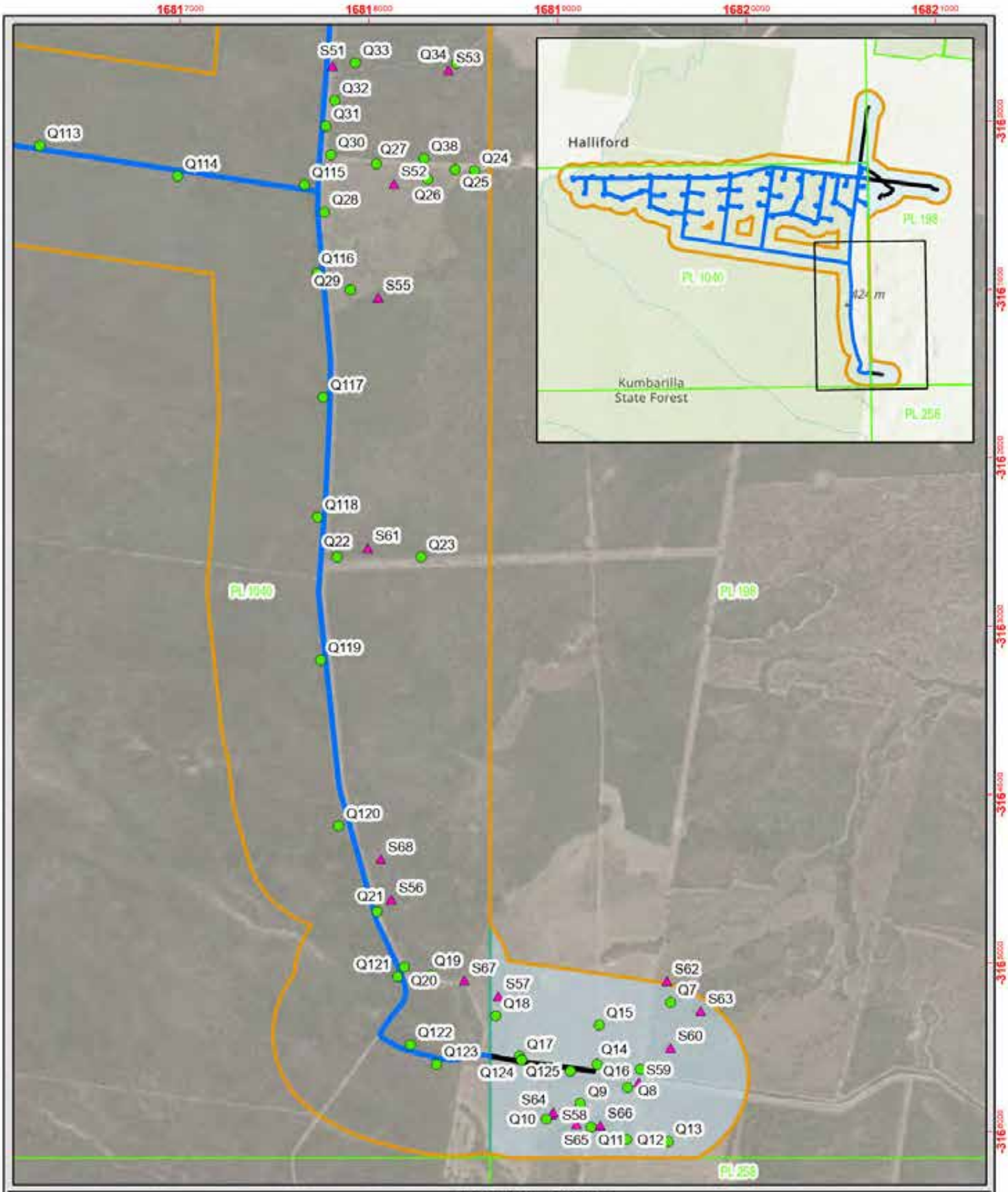

PL1040 - Tetris

Supplementary Data

500 m buffer

PL1040 - Proposed disturbance area

Ecology Assessment

Quaternary

Secondary

Source: Arrow Energy Pty Ltd
Geoscience Australia
Dept. Natural Resources and Mines

1.7 0.8 0 1.7 km

Scale: 1:59,000 @ A3

arrow energy
go further

Issued To: Department of Environment, Science and Innovation

Date: 24/10/2024 **Author:** Thiago Moura

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Table 1 - List of the Ecology Field Surveys taken for Secondary assessment of ecological values

Map ID	File Name	Easting	Northing	RE	Date
S1*	Duntroon Gravel Pit T1	311455	6964566	11.5.1	08/05/2012
S2*	Duntroon Gravel Pit T2	311311	6964719	Non-remnant	08/05/2012
S3*	Duntroon Gravel Pit T3	310775	6965682	11.5.1	09/05/2012
S4*	Duntroon Gravel Pit T4	310911	6965882	11.5.1	09/05/2012
S5*	Tipton Treated W Pipeline_S2	311165	6968430	11.5.1	19/11/2013
S6*	Tipton Treated W Pipeline_S3	310840	6968461	Non-remnant	19/11/2013
S7*	Tipton Helipad	310807	6968804	11.5.1	25/03/2015
S8*	Tipton 82	313067	6965368	Non-remnant	15/12/2015
S9*	Tipton 88	312481	6964707	Non-remnant	15/12/2015
S10*	Tipton 231	313886	6965291	Non-remnant	24/01/2018
S11*	Tipton 233	313394	6964570	Non-remnant	6/03/2018
S12*	Tipton 242	313429	6965072	Non-remnant	6/03/2018
S13*	Tipton 280	311066	6968024	Non-remnant	6/03/2018
S14*	Tipton 282	312408	6965481	Non-remnant	6/03/2018
S15*	Tipton 283	311539	6964813	11.7.4	6/03/2018
S16*	Tipton 270	311764	6965433	Non-remnant	7/03/2018
S17*	Tipton 294	311165	6965606	11.7.4	7/03/2018
S18*	McConnell Quarry	311184	6964519	11.5.1/11.7.4	5/09/2019
S19*	Halliford 51	310481	6965150	11.5.1	5/09/2019
S20*	Halliford 52	310540	6964407	11.5.1	5/09/2019
S21	Halliford 51	310381	6965168	11.5.1	05/09/2019
S22	Halliford 72 to Halliford 68 RoW	306529	6964404	11.7.4	9/09/2019
S23	Northern RoW	310123	6965514	11.7.4	9/09/2019
S24	Halliford 54 RoW	309796	6965505	11.5.20	9/09/2019
S25	Halliford 59	307155	6965484	11.5.1	10/09/2019
S26	Halliford 60	306533	6965654	11.5.4	10/09/2019
S27	Halliford 54	309690	6965191	11.5.1	16/09/2019
S28	Halliford 62	310017	6964016	11.5.1	16/09/2019
S29	Halliford 70	305774	6965682	11.7.4	17/09/2019
S30	Halliford 61	309209	6964501	11.5.1	17/09/2019
S31	Halliford 75	304985	6965617	11.5.4	17/09/2019
S32	Halliford 56	308759	6965071	11.7.4	17/09/2019
S33	Halliford 63	309214	6963780	11.5.1	17/09/2019
S34	Halliford 67 -1	307547	6964173	11.5.1	18/09/2019
S35	Halliford 77	304582	6964202	11.5.1	18/09/2019
S36	Halliford 74	305325	6964292	11.7.4	18/09/2019
S37	Halliford 58	307848	6965442	11.5.1	18/09/2019
S38	Halliford 95	298953	6964896	11.5.1	19/09/2019
S39	Halliford 88	300816	6965515	11.5.1	19/09/2019
S40	Halliford 85	301603	6965552	11.5.1	19/09/2019
S41	Halliford 78	304031	6965562	11.5.4	19/09/2019
S42	Halliford 82	302470	6965506	11.7.4	19/09/2019
S43	Halliford 97	303119	6963600	11.5.1	20/09/2019
S44	Halliford 76	304561	6965014	11.5.4	20/09/2019
S45	Halliford 73	305361	6964959	11.5.4	20/09/2019
S46	Halliford 94 and gathering	299704	6964818	11.5.20	15/10/2019
S47	Halliford 89 and gathering	300509	6964618	11.5.1	15/10/2019
S48	Halliford 87	301666	6964386	11.5.4	15/10/2019
S49	Halliford 104 Gathering	309941	6962646	Non-remnant	8/02/2021
S50	Halliford 100	310240	6962029	Non-remnant	8/02/2021
S51	Halliford 104	310487	6962633	11.7.4	8/02/2021
S52	Halliford 106	310460	6963519	11.5.1	8/02/2021
S53	Halliford 102	310175	6961427	11.5.4	9/02/2021

S54	Halliford 300	310285	6958254	11.7.4	10/02/2021
S55	Tipton 636	310796	6957755	Non-remnant	10/02/2021
S56	Tipton 633	311056	6957132	Non-remnant	16/02/2021
S57*	EFS01	311464	6957311	Non-remnant	10/08/2021
S58*	EFS04	311610	6957494	Non-remnant	10/08/2021
S59*	EFS07	310146	6960107	11.7.4	12/08/2021
S60*	Lynwood FCS 19	311588	6957845	11.7.4	13/12/2023
S61	Lynwood FCS 20	311749	6957690	11.7.4	13/12/2023
S62	BRP1-1	311064	6957146	Cleared	4/03/2024
S63*	BRP1-2	311174	6957085	Non-remnant	4/03/2024
S64*	BRP1-3	311286	6957080	Non-remnant	4/03/2024
S65*	BRP1-8	310635	6957834	11.7.4	5/03/2024
S66*	BRP1-9	310233	6958467	11.7.4	5/03/2024
S67	BRP1-13	310269	6963411	11.5.1	6/03/2024
S68	Lyn-Tip01	310659	6968335	11.5.1	2/04/2024
S69	Lyn-Tip02	310628	6968321	Cleared	2/04/2024
S70*	Lyn-Tip03	311843	6964967	11.7.4	2/04/2024
S71*	Tetris 1-TR1	310350	6965783	11.7.4	22/07/2024
S72*	Tetris 1-TR2	310462	6965154	11.5.1	22/07/2024
S73	Tetris 1-TR3	311986	6965284	11.5.1	23/07/2024
S74	Tetris 1-TR4	313102	6965139	11.5.1	23/07/2024
S75*	Tetris 1-TR5	310536	6964423	11.5.1	23/07/2024
S76*	Tetris 1-TR6	309754	6965186	11.5.1	23/07/2024
S77	Tetris 1-TR7	309199	6965588	11.5.1	23/07/2024
S78	Tetris 1-TR8	308381	6965701	11.7.4 Regrowth	23/07/2024
S79	Tetris 1-TR9	309353	6965070	11.5.1	24/07/2024
S80	Tetris 1-TR10	309213	6964470	11.7.4 Regrowth	24/07/2024
S81	Tetris 1-TR11	309898	6964028	11.5.1	24/07/2024
S82	Tetris 1-TR12	308753	6965086	11.7.4	24/07/2024
S83	Tetris 1-TR13	308506	6964359	11.7.4 Regrowth	24/07/2024
S84	Tetris 1-TR14	308485	6963648	11.7.4 Regrowth	24/07/2024
S85	Tetris 1-TR15	309078	6963766	11.5.1 Regrowth	24/07/2024
S86	Tetris 1-TR16	307795	6965444	11.5.1 Regrowth	25/07/2024
S87	Tetris 1-TR17	307868	6964693	11.7.4	25/07/2024
S88	Tetris 1-TR18	307481	6964040	11.5.1	25/07/2024
S89	Tetris 1-TR19	306696	6963956	11.7.4 Regrowth	25/07/2024
S90	Tetris 1-TR20	306140	6964426	11.7.4 Regrowth	25/07/2024
S91	Tetris 1-TR21	306979	6964729	11.7.4	25/07/2024
S92	Tetris 1-TR22	306247	6965060	11.7.4 Regrowth	25/07/2024
S93	Tetris 1-TR23	306503	6965677	11.5.4	25/07/2024
S94	Tetris 1-TR24	307141	6965458	11.5.1	26/07/2024
S95	Tetris 1-TR25	305750	6965686	11.7.4	26/07/2024
S96	Tetris 1-TR26	304929	6965626	11.5.4 Regrowth	26/07/2024
S97	Tetris 1-TR27	304512	6964995	11.5.4 Regrowth	5/08/2024
S98	Tetris 1-TR28	305348	6965033	11.5.4 Regrowth	5/08/2024
S99	Tetris 1-TR29	305363	6964267	11.5.4 Regrowth	5/08/2024
S100	Tetris 1-TR30	304550	6964226	11.7.4	5/08/2024
S101	Tetris 1-TR36	304498	6965543	11.7.4	5/08/2024
S102	Tetris 1-TR37	302504	6965495	11.7.4	5/08/2024
S103	Tetris 1-TR38	299708	6964726	11.5.20	5/08/2024
S104	Tetris 1-TR39	298953	6964923	11.5.1 Regrowth	5/08/2024
S105	Tetris 1-TR31	303796	6964826	11.7.4	6/08/2024
S106	Tetris 1-TR32	302958	6964800	11.7.4 Regrowth	6/08/2024
S107	Tetris 1-TR33	303781	6964039	11.7.4 Regrowth	6/08/2024
S108	Tetris 1-TR34	302539	6964058	11.5.1 Regrowth	6/08/2024

S109	Tetris 1-TR35	303074	6963643	11.7.4	6/08/2024
S110	Tetris 1-TR40	298324	6965539	11.3.4	6/08/2024
S111	Tetris 1-TR41	302217	6964763	11.5.1	6/08/2024
S112	Tetris 1-TR42	301654	6964357	11.5.1	6/08/2024

*Supplementary data

Table 2 - List of the Ecology Field Surveys taken for Quaternary assessment of ecological values

Map ID	File Name	Easting	Northing	RE	Date
Q1	Road Kumbarilla SF	310183	6965168	Non-remnant	6/09/2019
Q2	Halliford 62	309327	6964477	Non-remnant	16/09/2019
Q3	Halliford 90	300031	6965521	Non-remnant	19/09/2019
Q4	Halliford 92	298347	6965531	Non-remnant	19/09/2019
Q5	Halliford 86	301311	6964961	Non-remnant	15/10/2019
Q6	Tipton Water Pipeline	309754	6969313	Non-remnant	22/02/2021
Q7*	Lynwood_koala_16	311607	6957731	Non-remnant	11/12/2023
Q8*	BRP1-RE1	311412	6957279	11.7.4	5/03/2024
Q9*	BRP1-RE2	311190	6957192	Non-remnant	5/03/2024
Q10*	BRP1-RE3	311032	6957107	11.7.4	5/03/2024
Q11*	BRP1-RE4	311243	6957068	11.5.1/11.7.4	5/03/2024
Q12*	BRP1-RE5	311412	6957005	11.5.1	5/03/2024
Q13*	BRP1-RE6	311607	6956997	11.5.1	5/03/2024
Q14*	BRP1-RE10	311267	6957399	11.7.4	6/03/2024
Q15*	BRP1-RE11	311273	6957606	11.7.4	6/03/2024
Q16*	BRP1-RE22	311469.8	6957377	11.5.20	6/03/2024
Q17*	BRP1-RE23	310901.5	6957436	11.5.1	6/03/2024
Q18*	BRP1-RE24	310787	6957647	11.5.4	6/03/2024
Q19	BRP1-RE25	310476	6957856	11.5.1	6/03/2024
Q20	BRP1-RE26	310352.2	6957897	11.5.1	6/03/2024
Q21	BRP1-RE27	310219.5	6958188	11.7.4	6/03/2024
Q22	BRP1-RE28	310002.3	6960055	11.5.1	6/03/2024
Q23	BRP1-RE29	310398.7	6960061	11.5.4	6/03/2024
Q24	BRP1-RE42	310617.8	6962101	11.7.4	6/03/2024
Q25	BRP1-RE43	310526.2	6962106	11.5.1	6/03/2024
Q26	BRP1-RE44	310398.6	6962053	11.5.1	6/03/2024
Q27	BRP1-RE45	310155.5	6962130	11.5.1	6/03/2024
Q28	BRP1-RE46	309915.5	6961872	11.7.4	6/03/2024
Q29	BRP1-RE47	310042.8	6961465	11.5.1	6/03/2024
Q30	BRP1-RE48	309940.7	6962173	11.5.1	6/03/2024
Q31	BRP1-RE49	309915.1	6962325	11.5.1	6/03/2024
Q32	BRP1-RE50	309954.8	6962461	11.5.1	6/03/2024
Q33	BRP1-RE51	310048.2	6962662	11.5.4	6/03/2024
Q34	BRP1-RE52	310524.2	6962665	11.7.4	6/03/2024
Q35	BRP1-RE53	309998.3	6963010	11.5.1	6/03/2024
Q36	BRP1-RE54	310477.8	6963525	11.5.4	6/03/2024
Q37	BRP1-RE55	310075.8	6963341	11.5.4	6/03/2024
Q38	BRP1-RE56	310378.7	6962162	11.5.20	6/03/2024
Q39*	LynTip-RE01	310604	6968117	11.5.1	2/04/2024
Q40*	LynTip-RE02	310542	6967592	11.5.4	2/04/2024
Q41*	LynTip-RE03	310432	6966807	Non-remnant	2/04/2024
Q42	LynTip-RE04	310345	6966224	Non-remnant	2/04/2024
Q43*	LynTip-RE05	310395	6965968	11.7.4	2/04/2024
Q44*	LynTip-RE06	310819	6965740	11.7.4	2/04/2024
Q45*	LynTip-RE07	311243	6965382	11.7.4	2/04/2024
Q46*	LynTip-RE08	311407	6965240	Cleared	2/04/2024

Q47*	LynTip-RE09	311990	6964881	Non-remnant	2/04/2024
Q48*	LynTip-RE14	312110	6964778	Non-remnant	2/04/2024
Q49*	LynTip-RE15	311963	6964855	11.7.4	2/04/2024
Q50*	LynTip-RE16	311509	6965121	11.7.4	2/04/2024
Q51*	LynTip-RE17	310963	6965604	11.5.1	2/04/2024
Q52	Tetris1-RE1	310309	6965875	11.5.1	22/07/2024
Q53*	Tetris1-RE2	311168	6964701	Cleared	22/07/2024
Q54*	Tetris1-RE3	311599	6964945	11.7.4	22/07/2024
Q55*	Tetris1-RE4	311472	6965197	11.7.4	22/07/2024
Q56*	Tetris1-RE5	310656	6965454	11.5.1	22/07/2024
Q57	Tetris 1-KS1	310314	6965110	11.5.1	22/07/2024
Q58*	Tetris1-RE6	311780	6965309	11.5.1	23/07/2024
Q59*	Tetris1-RE7	312786	6965167	11.5.1	23/07/2024
Q60	Tetris1-RE8	308776	6965713	11.5.1	23/07/2024
Q61	Tetris 1-KS2	309778	6965352	11.5.1	23/07/2024
Q62	Tetris1-RE9	309400	6965429	11.7.4 Regrowth	24/07/2024
Q63	Tetris1-RE10	309294	6964559	11.5.1	24/07/2024
Q64	Tetris1-RE11	309665	6964294	11.7.4 Regrowth	24/07/2024
Q65	Tetris1-RE12	310085	6964463	11.5.1	24/07/2024
Q66	Tetris1-RE13	310158	6965170	11.7.4	24/07/2024
Q67	Tetris1-RE14	308835	6965437	11.7.4 Regrowth	24/07/2024
Q68	Tetris1-RE15	308730	6964598	11.7.4 Regrowth	24/07/2024
Q69	Tetris1-RE16	308586	6963830	11.5.1 Regrowth	24/07/2024
Q70	Tetris 1-KS3	309312	6964682	11.5.1 Regrowth	24/07/2024
Q71	Tetris 1-KS4	309460	6964424	11.7.4	24/07/2024
Q72	Tetris1-RE17	307919	6965282	11.5.1	25/07/2024
Q73	Tetris1-RE18	307605	6964293	11.7.4 Regrowth	25/07/2024
Q74	Tetris1-RE19	306292	6964382	11.7.4 Regrowth	25/07/2024
Q75	Tetris1-RE20	306679	6964788	11.7.4	25/07/2024
Q76	Tetris1-RE21	306699	6965609	11.7.4 Regrowth	25/07/2024
Q77	Tetris1-RE22	307210	6965630	11.5.4	26/07/2024
Q78	Tetris1-RE23	306380	6965897	11.5.1	26/07/2024
Q79	Tetris1-RE24	305301	6965634	11.7.4	26/07/2024
Q80	Tetris 1-KS5	307219	6965537	11.5.4 Regrowth	26/07/2024
Q81	Tetris1-RE25	305084	6964990	11.5.4 Regrowth	5/08/2024
Q82	Tetris1-RE26	305053	6964383	11.5.4 Regrowth	5/08/2024
Q83	Tetris1-RE27	304735	6963795	11.5.4 Regrowth	5/08/2024
Q84	Tetris1-RE54	304845	6965567	11.7.4	5/08/2024
Q85	Tetris1-RE55	303999	6965543	11.7.4	5/08/2024
Q86	Tetris1-RE56	303644	6965482	11.7.4	5/08/2024
Q87	Tetris1-RE57	303231	6965599	11.5.20	5/08/2024
Q88	Tetris1-RE58	302236	6965509	11.5.1 Regrowth	5/08/2024
Q89	Tetris1-RE59	299262	6965591	11.7.4	5/08/2024
Q90	Tetris1-RE60	298992	6965451	11.7.4 Regrowth	5/08/2024
Q91	Tetris1-RE28	303427	6964933	11.7.4 Regrowth	6/08/2024
Q92	Tetris1-RE29	303337	6964086	11.5.1 Regrowth	6/08/2024
Q93	Tetris1-RE30	302862	6964044	11.7.4	6/08/2024
Q94	Tetris1-RE31	303434	6963014	11.3.4	6/08/2024
Q95	Tetris 1-KS6	303069	6964098	11.5.1	6/08/2024
Q96	Tetris1-RE61	298665	6965508	11.5.1	6/08/2024
Q97	Tetris1-RE62	298457	6965521	Non-remnant	6/08/2024
Q98	Tetris1-RE63	300480	6964635	11.5.4	6/08/2024
Q99	Tetris1-RE64	300056	6965576	Non-remnant	6/08/2024
Q100	Tetris1-RE65	300860	6965558	11.7.4	6/08/2024
Q101	Tetris1-RE66	301610	6965585	11.7.4	6/08/2024

Q102	Tetris1-RE67	301674	6964799	11.5.1	6/08/2024
Q103	Tetris1-RE68	301260	6964878	Non-remnant	6/08/2024
Q104	Tetris1-RE32	306343	6963397	Non-remnant	7/08/2024
Q105	Tetris1-RE33	306258	6962835	11.7.4	7/08/2024
Q106	Tetris1-RE34	306271	6962610	11.7.4 Regrowth	7/08/2024
Q107	Tetris1-RE35	305696	6962656	11.7.4	7/08/2024
Q108	Tetris1-RE36	305047	6962695	11.5.4	7/08/2024
Q109	Tetris1-RE37	304699	6962801	11.5.4 Regrowth	7/08/2024
Q110	Tetris1-RE38	306952	6962405	11.7.4 Regrowth	7/08/2024
Q111	Tetris1-RE39	307495	6962375	11.5.1 Regrowth	7/08/2024
Q112	Tetris1-RE40	308061	6962236	11.5.1 Regrowth	7/08/2024
Q113	Tetris1-RE41	308571	6962201	11.5.1 Regrowth	7/08/2024
Q114	Tetris1-RE42	309222	6962050	11.7.4	7/08/2024
Q115	Tetris1-RE43	309819	6962014	11.7.4 Regrowth	7/08/2024
Q116	Tetris1-RE44	309886	6961548	11.7.4 Regrowth	7/08/2024
Q117	Tetris1-RE45	309924	6960895	11.5.4 Regrowth	7/08/2024
Q118	Tetris1-RE46	309907	6960263	11.7.4 Regrowth	7/08/2024
Q119	Tetris1-RE47	309934	6959510	11.5.4 Regrowth	7/08/2024
Q120	Tetris1-RE48	310032	6958637	11.5.4 Regrowth	7/08/2024
Q121	Tetris1-RE49	310321	6957845	11.5.4 Regrowth	7/08/2024
Q122	Tetris1-RE50	310388	6957489	11.5.4 Regrowth	7/08/2024
Q123	Tetris1-RE51	310512	6957388	11.7.4	7/08/2024
Q124*	Tetris1-RE52	310911	6957417	11.5.1	7/08/2024
Q125*	Tetris1-RE53	311142	6957361	11.5.1	7/08/2024

*Supplementary data

Koala Survey Datasheet

Kumbarilla SF

Site: Tetris 1.	Date: 6.9.2019	Lat: ~~31°28'~~	Long: 696516 8
Vegetation community description: Remnant.		310183	

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. Eucalyptus fibrosa	24%
2. E. crebra	24%
3. E. woollsiana	2%
4.	
5.	
6.	
Total Canopy Cover:	50%
Vegetation ground cover (% of the ground area):	30%
Leaf litter cover (% of the ground area):	50%
Bare ground cover (% of the ground area):	20%
Area of surface water (% of the ground area):	0
Distance (m) to surface water:	?
Evidence of dogs in the area?	Dingo sign within 1 km
Evidence of scratches/scats (type and age)?	No

Spot Assessment Technique (Phillips & Callaghan 2011).

Number of trees with Koala scats beneath (within 1m of tree base)	0
Total number of trees surveyed	40
Proportion of trees with Koala scats beneath	0

Were any Koalas observed? If so, record where possible...

Koala's sex:	
Koala's disease status:	
Koala's reproductive status:	
Tree species:	
Tree height:	
Tree DBH:	

Photograph log.

Photo number	Description

LAR 1236 Tetra

SITE IDENTIFICATION			
Site Name:	Helifield 62	Date:	16 September 2019
Tenure:	PL 1040	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION					
Development Type				Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility			Easting (E)	309991
☐ Pilot Well + Dam	☐ Dam			Northing (N)	6964027
☐ Monitoring	☐ Pipeline			Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line			Other description	
☐ Work over	☐ Property (area) wide				

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 118		#	
East	# 119		#	
South	# 120		#	
West	# 121		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	(Absent)	Scattered	Frequent													
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank										

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	12m				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	17		**Avg DBH (cm) of EDL**	20	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

12 24 15M
3+4 4

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	E 270	Start Easting	310017	End Easting	309977
		Start Northing	6964016	End Northing	6964033

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		12 | 24	2 | 12		1 | 2	0.1 | 1
Canopy cover (%)		30	10		2	1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus cvebara		23		5	1			17
Callitris glaucophylla		4		2	2			
Acacia leiocalyx		4			2		2	
A. ramulosa		13					5	8
Allocasuarina luehmannii		1						1
Gahnia aspera								
Solanum esuvicle								
Chiladtes sieberi	Chiladtes	sieberi v sieberi						

NR1
T1 T2
Sc 17
BCP
T1 T2
A. leiocalyx
T2 S1 8
Acacia
S1
Dodonaea
S1 Sc
8
B.O Sc

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	122	123	124	125	126	
Native perennial grass						
Native other grass (if relevant)			10			
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	50	~~70~~ 75	50	65	100	
Rock						
Bare ground	50	23	40	30		
Cryptogams		2		5		
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	NA	LC	Not
Survey result	11.5.1	NA	LC	Not
Agree with mapped RE? If no, provide justification from field data	No Field verified by 3D Ecosmart close to bounds of RE 11.5.1			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	12	Total length of logs (>10cm)	17	No. of logs (>10cm)	28
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for nectar / pollen	Absent	Scattered	(Common)	Abundant
Potential for fleshy fruiting plants	(Absent)	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	(Scattered)	Common	Abundant
Dense shrub/grass shelter	(Absent)	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	(Common)	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	(Scattered)	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	(Scattered)	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	(Scattered)	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	(Common)	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	(Common)	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	(Common)	Abundant
Mistletoe/Epiphytes	Absent	Scattered	(Common)	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remnant vegetat
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No (Yes) / No (Yes) / (No)		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Kombaillo SF

Koala Survey Datasheet Refuj

Site: H62 ROW	Date: 16.9.2019	Lat: 309327	Long: 696477
Vegetation community description: M.S-1			

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. Eucalyptus crebra	27%
2. Call. tris glaucophylla	3%
3.	
4.	
5.	
6.	
Total Canopy Cover:	30%
Vegetation ground cover (% of the ground area):	6%
Leaf litter cover (% of the ground area):	50
Bare ground cover (% of the ground area):	44%
Area of surface water (% of the ground area):	0%
Distance (m) to surface water:	?
Evidence of dogs in the area?	Few dogs observed
Evidence of scratches/scats (type and age)?	No

Spot Assessment Technique (Phillips & Callaghan 2011).

Number of trees with Koala scats beneath (within 1m of tree base)	0
Total number of trees surveyed	40
Proportion of trees with Koala scats beneath	0

Were any Koalas observed? If so, record where possible...

Koala's sex:	
Koala's disease status:	
Koala's reproductive status:	
Tree species:	
Tree height:	
Tree DBH:	

Photograph log.

Photo number	**Description**

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Koala Survey Datasheet

Kuranda SP

Site: Habitat 90	Date: 19/9/2019	Lat: 3000391	Long: 6% 5521
Vegetation community description: 11.5.20			

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. Eucalyptus woollsiana 21 individuals	
2. E. chlorocladia 13 individuals	
3. Angophora leiocarpa 6 individuals	
4.	
5.	
6.	
Total Canopy Cover:	30 %
Vegetation ground cover (% of the ground area):	10%
Leaf litter cover (% of the ground area):	50%
Bare ground cover (% of the ground area):	40%
Area of surface water (% of the ground area):	0
Distance (m) to surface water:	?
Evidence of dogs in the area?	Dingo Sign
Evidence of scratches/scats (type and age)?	No

Spot Assessment Technique (Phillips & Callaghan 2011).

Number of trees with Koala scats beneath (within 1m of tree base)	0
Total number of trees surveyed	40
Proportion of trees with Koala scats beneath	0

Were any Koalas observed? If so, record where possible...

Koala's sex:	
Koala's disease status:	
Koala's reproductive status:	
Tree species:	
Tree height:	
Tree DBH:	

Photograph log.

Photo number	Description

Kunbarilla SF

Koala Survey Datasheet

Site: Lot 92	Date: 19.9.2019	Lat: 298347	Long: 6761531
Vegetation community description: Forest 11.3.4 on Wilkie Creek			

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. Eucalyptus wallisiana	18 individuals
2. E. cretata	12 individuals
3. E. canaldulensis	10 individuals
4.	
5.	
6.	
Total Canopy Cover:	30%
Vegetation ground cover (% of the ground area):	10%
Leaf litter cover (% of the ground area):	40%
Bare ground cover (% of the ground area):	50%
Area of surface water (% of the ground area):	0
Distance (m) to surface water:	50m
Evidence of dogs in the area?	Dingo scat in SF
Evidence of scratches/scats (type and age)?	No

Spot Assessment Technique (Phillips & Callaghan 2011).

Number of trees with Koala scats beneath (within 1m of tree base)	0
Total number of trees surveyed	40
Proportion of trees with Koala scats beneath	0

Were any Koalas observed? If so, record where possible...

Koala's sex:	
Koala's disease status:	
Koala's reproductive status:	
Tree species:	
Tree height:	
Tree DBH:	

Photograph log.

Photo number	Description

Koala Survey Datasheet

Site: Halliford 86	Date: 15/10/19	Lat: 301311	Long: 6964961
Vegetation community description: See EFS for Halliford 89			

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. Eucalyptus crebra	15
2. Allocasuarina luehmanii	10
3. Melaleuca decora	5
4.	
5.	
6.	
Total Canopy Cover:	20
Vegetation ground cover (% of the ground area):	20
Leaf litter cover (% of the ground area):	70
Bare ground cover (% of the ground area):	30
Area of surface water (% of the ground area):	0
Distance (m) to surface water:	700m
Evidence of dogs in the area?	YES - sightings
Evidence of scratches/scats (type and age)?	NO

Spot Assessment Technique (Phillips & Callaghan 2011).

Number of trees with Koala scats beneath (within 1m of tree base)	30
Total number of trees surveyed	**30**
Proportion of trees with Koala scats beneath	0

Were any Koalas observed? If so, record where possible...

Koala's sex:	
Koala's disease status:	
Koala's reproductive status:	
Tree species:	
Tree height:	
Tree DBH:	

Photograph log.

Photo number	**Description**

Tinka water Pipeline

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 1 Recorder: Peter Hall Day/Date: 22 February 2021

Purpose RE Field verification

Locality: (inc. distance/direction to nearest town) 30 km SW Dalby

GPS: Zone 56 E 0307754 N 6769313

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	10 - 18	S
T2	6	4 - 10	S
T3		-	
S1	1.5	1 - 4	S
S2		-	
G	0.5	0.1 - 1	D

Structural formation: (including height) W

Ecologically dominant layer: T_1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T_1	c	Eucalyptus camaldulensis
T_1	c	Callitris glaucophylla
T_1	c	Allocasuarina leuhmannii
T_2		Same as ~~dom~~ T_1
T_2	a	Acacia decora
S_1		As for T_1 & T_2
G.	d	Cahnia aspera
G.	a	Aristida caput medusae

Geology, landform, soils

Geology map/scale/year: Kumbarilla beds

Geology code and rock types: JKk: Sandstone, siltstone, mudstone conglomerate

Land system:

Landform: level to undulating

Soils: Deep, sandy

Field observation and notes: Photos 12N, 13E, 14S, 15W

Landzone: 3

RE code changes

Existing RE code: ~~11.3.2/11.3.18 60/40~~ Cat X

Proposed RE code: 11.3.4 NVR

END

Koala Survey Datasheet

Site: 16	Date: 13/11/2023	Lat: 311607	Long: 6957731
Vegetation community description: 11.7.4			

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. Eucalyptus populnea	30
2. Callitris glaucophylla	30
3. Allocasuarina luehmannii	10
4.	
5.	
6.	
Total Canopy Cover:	60
Vegetation ground cover (% of the ground area):	60
Leaf litter cover (% of the ground area):	20
Bare ground cover (% of the ground area):	10
Area of surface water (% of the ground area):	–
Distance (m) to surface water:	–
Evidence of dogs in the area?	No
Evidence of scratches/scats (type and age)?	No

Spot Assessment Technique (Phillips & Callaghan 2011).

Number of trees with Koala scats beneath (within 1m of tree base)	0
Total number of trees surveyed	30
Proportion of trees with Koala scats beneath	0

Were any Koalas observed? If so, record where possible…

Koala's sex:	
Koala's disease status:	
Koala's reproductive status:	
Tree species:	
Tree height:	
Tree DBH:	

Photograph log.

Photo number	Description

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 01 **Recorder:** Thiago Moura **Day/Date:** 05 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS BRP1-01

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0311412 N 6957279

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.5	0.1 - 1	M

Structural formation: (including height)
Cleared

Ecologically dominant layer: Ground

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	D	Aristida ramosa
G	A	Glandularia aristigera
G	A	Eragrostis elongata
G	A	Opuntia tomentosa

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: 11.5.1 / 11.3.18 Government data

Proposed RE code: Cleared

END

North face of transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 02 **Recorder:** Thiago Moura **Day/Date:** 05 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS BRP1-02

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0311190 N 6957192

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	9	6 - 10	M
T2	4	3 - 5	S
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.5	0.1 - 1	M

Structural formation: (including height)

Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus populnea
T2	C	Callitris glaucophylla
S1	A	Eucalyptus populnea
G	A	Aristida ramosa
G	A	Opuntia tomentosa
G	A	Glandularia aristigera

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: Regrowth 11.5.1

Proposed RE code: Non-remnant

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 03 **Recorder:** Thiago Moura **Day/Date:** 05 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS BRP1-02

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0311032 N 6957107

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	11	8 - 15	M
T1	4	2 - 7	S
T2		-	
T3		-	
S1	1	1 - 2	S
S2		-	
G		-	

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	
T1	A	
T2	A	
T2	A	
S1	A	

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: Cleared

Proposed RE code: Non-remnant

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 04 **Recorder:** Thiago Moura **Day/Date:** 05 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS BRP1-01

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0311243 N 6957068

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.5	0.1 - 1	M

Structural formation: (including height)
Cleared

Ecologically dominant layer: Ground

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	D	Aristida ramosa
G	A	Glandularia aristigera
G	A	Eragrostis elongata
G	A	Opuntia tomentosa

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: 11.5.1 / 11.3.18 Government data

Proposed RE code: Cleared

END

North face of transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 05 **Recorder:** Thiago Moura **Day/Date:** 05 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS BRP1-01

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0311412 N 6957005

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.5	0.1 - 1	M

Structural formation: (including height)
Cleared

Ecologically dominant layer: Ground

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	D	Aristida ramosa
G	A	Glandularia aristigera
G	A	Eragrostis elongata
G	A	Opuntia tomentosa

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: 11.5.1 / 11.3.18 Government data

Proposed RE code: Cleared

END

North face of transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 06 **Recorder:** Thiago Moura **Day/Date:** 05 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS BRP1-01

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0311607 N 6956997

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.5	0.1 - 1	M

Structural formation: (including height)
Cleared

Ecologically dominant layer: Ground

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	D	Aristida ramosa
G	A	Glandularia aristigera
G	A	Eragrostis elongata
G	A	Opuntia tomentosa

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: 11.5.1 / 11.3.18 Government data

Proposed RE code: Cleared

END

North face of transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 10 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS BRP1-01

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0311267 N 6957399

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.5	0.1 - 1	M

Structural formation: (including height)
Cleared

Ecologically dominant layer: Ground

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	D	Aristida ramosa
G	A	Glandularia aristigera
G	A	Eragrostis elongata
G	A	Opuntia tomentosa

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: 11.5.1 / 11.3.18 Government data

Proposed RE code: Cleared

END

North face of transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 11 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS BRP1-01

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0311273 N 6957606

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.5	0.1 - 1	M

Structural formation: (including height)
Cleared

Ecologically dominant layer: Ground

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	D	Aristida ramosa
G	A	Glandularia aristigera
G	A	Eragrostis elongata
G	A	Opuntia tomentosa
G	A	Hypochaeris albiflora

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: 11.5.1 / 11.3.18 Government data

Proposed RE code: Cleared

END

North face of transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 22 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFSBRP1-06

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0311471 N 6957378

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.5	0.1 - 1	M

Structural formation: (including height)

Cleared

Ecologically dominant layer: G

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	A	Aristida ramosa
G	A	Glandularia aristigera
G	A	Eragrostis elongata
G	A	Wahlenbergia capillaris

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: 11.5.4 / 11.3.18

Proposed RE code: Cleared

END

North face of transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 23 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS BRP1-06

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310901 N 6957437

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.5	0.1 - 1	M

Structural formation: (including height)

Cleared

Ecologically dominant layer: G

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	A	Aristida ramosa
G	A	Glandularia aristigera
G	A	Eragrostis elongata
G	A	Wahlenbergia capillaris

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: 11.5.4 / 11.3.18

Proposed RE code: Cleared

END

North face of transect

East face of the transect

South face of the transect

NA

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 24 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP07

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310787 N 6957648

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	3	2 - 6	M
T2	1.5	1 - 3	S
T3		-	
S1		-	
S2		-	
G		-	

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Acacia leiocalyx
T1	C	Callitris glaucophylla
T1	A	Eucalyptus crebra

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: 11.5.4 / 11.3.18

Proposed RE code: Non-remnant

END

North face of transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 28 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-08

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310476 N 6957857

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	18	17 - 20	V
T1	10	8 - 15	M
T2		-	
T3		-	
S1	1	1 - 2	V
S2		-	
G	0.3	0.1 - 0.5	S

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Acacia leiocalyx
T1	A	Corymbia clarksoniana
E	A	Eucalyptus crebra
T1	A	Eucalyptus crebra
T1	A	Callitris glaucophylla
T2	A	Eucalyptus crebra
T2	A	Acacia leiocalyx
T2	A	Callitris glaucophylla
E	A	Angophora leicarpa
S1	A	Acacia leiocalyx

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Dark brow / clay laom sandy

Field observation and notes: None

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 26 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS BRP1-06

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310353 N 6957899

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.5	0.1 - 1	M

Structural formation: (including height)

Cleared

Ecologically dominant layer: G

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	A	Aristida ramosa
G	A	Glandularia aristigera
G	A	Eragrostis elongata
G	A	Wahlenbergia capillaris

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: 11.5.4 / 11.3.18

Proposed RE code: Cleared

END

North face of transect

East face of the transect

South face of the transect

NA

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 27 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS BRP1-06

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310220 N 6958189

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.5	0.1 - 1	M

Structural formation: (including height)

Cleared

Ecologically dominant layer: G

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	A	Aristida ramosa
G	A	Glandularia aristigera
G	A	Eragrostis elongata
G	A	Wahlenbergia capillaris

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: 11.5.4 / 11.3.18

Proposed RE code: Cleared

END

North face of transect

East face of the transect

South face of the transect

NA

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 28 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-09

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310002 N 6960055

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	18	17 - 20	V
T1	10	8 - 15	M
T2		-	
T3		-	
S1	1	1 - 2	V
S2		-	
G	0.3	0.1 - 0.5	S

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Acacia leiocalyx
T1	A	Corymbia clarksoniana
E	A	Eucalyptus crebra
T1	A	Eucalyptus crebra
T1	A	Callitris glaucophylla
T2	A	Eucalyptus crebra
T2	A	Acacia leiocalyx
T2	A	Callitris glaucophylla
E	A	Angophora leicarpa
S1	A	Acacia leiocalyx

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Dark brow / clay laom sandy

Field observation and notes: None

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 29 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS BRP1-06

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310002 N 6960056

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.5	0.1 - 1	M

Structural formation: (including height)

Cleared

Ecologically dominant layer: G

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	A	Aristida ramosa
G	A	Glandularia aristigera
G	A	Eragrostis elongata
G	A	Wahlenbergia capillaris

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy

Land system:

Landform: Plains

Soils: Dark brown / Silty clay loam

Field observation and notes: Soil compacted by grazing activities

Landzone: 5

RE code changes

Existing RE code: 11.5.4 / 11.3.18

Proposed RE code: Cleared

END

North face of transect

East face of the transect

South face of the transect

NA

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 41 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS BRP1-10

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310618 N 6962101

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	10	9 - 15	M
T2	5	4 - 8	S
T3		-	
S1	1	1 - 2	V
S2		-	
G	0.3	0.1 - 0.5	V

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1		Eucalyptus crebra
T1		Eucalyptus populnea
T1		Allocasuarina luehmanni
T1		Callitris glaucophylla
T2		Eucalyptus crebra
T2		Allocasuarina luehmanni
T2		Callitris glaucophylla
S1		Allocasuarina luehmanni
S1		Callitris glaucophylla

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types:

Land system:

Landform: Tertiary-early Quaternary loamy and sandy plains and plateaus

Soils: Brown / Clay loam sandy

Field observation and notes: None

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE53

Site No. _____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0311142 N 6957361

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	13	10-16	S
T2			
T3			
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (13m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. populnea*
T1	a	E. crebra/ Calitris glaucophylla
S1	a	*Acacia leiocalyx*
G	a	*Acacia salicina*
G	a	*Dianella caerulea*
G	a	*Gahnia aspera*
G	a	*Aristida caput-medusae*
G	a	*Melinis ripens*
G	a	*Cheilanthes sieberi*
G	a	*Opuntia stricta*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat to gently undulating plains

Soils: Sandy loam

Field observation and notes: No soil crack, E. populnea dominated vegetation along the road reserve

Photos:7891-7894 **Landzone:** 05

RE code changes

Existing RE code: 11.5.1a (3D)

Proposed RE code: 11.5.1

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 43 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-11

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310526 N 6962106

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	10 - 17	
T2	2	2 - 3	
T3		-	
S1		-	
S2		-	
G	0.3	0.1 - 0.5	

Structural formation: (including height)

Woodland

Ecologically dominant layer: T2

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T2	D	Callitris glaucophylla
T2	C	Acacia leiocalyx
T2	A	Allocasuarina luehmannii
T1	A	Eucalyptus crebra
G	A	Aristida ramosa
G	A	Dichanthium sericeum
G	A	Eragrostis elongata
G	A	Sida hackettiana
G	A	Eriachne mucronata
G	A	Hibiscus sturtii

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy plains and plateaus

Land system:

Landform: Plain

Soils: Pale Brow / Clay loam sandy

Field observation and notes: None

Landzone: 5

RE code changes

Existing RE code: Cleared

Proposed RE code: Non-remnant

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 44 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-11

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310399 N 6962053

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	10 - 17	
T2	2	2 - 3	
T3		-	
S1		-	
S2		-	
G	0.3	0.1 - 0.5	

Structural formation: (including height)

Woodland

Ecologically dominant layer: T2

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T2	D	Callitris glaucophylla
T2	C	Acacia leiocalyx
T2	A	Allocasuarina luehmannii
T1	A	Eucalyptus crebra
G	A	Aristida ramosa
G	A	Dichanthium sericeum
G	A	Eragrostis elongata
G	A	Sida hackettiana
G	A	Eriachne mucronata
G	A	Hibiscus sturtii

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy plains and plateaus

Land system:

Landform: Plain

Soils: Pale Brow / Clay loam sandy

Field observation and notes: None

Landzone: 5

RE code changes

Existing RE code: Cleared

Proposed RE code: Non-remnant

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 45 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-11

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310156 N 6962130

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	10 - 17	
T2	2	2 - 3	
T3		-	
S1		-	
S2		-	
G	0.3	0.1 - 0.5	

Structural formation: (including height)

Woodland

Ecologically dominant layer: T2

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T2	D	Callitris glaucophylla
T2	C	Acacia leiocalyx
T2	A	Allocasuarina luehmannii
T1	A	Eucalyptus crebra
G	A	Aristida ramosa
G	A	Dichanthium sericeum
G	A	Eragrostis elongata
G	A	Sida hackettiana
G	A	Eriachne mucronata
G	A	Hibiscus sturtii

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy plains and plateaus

Land system:

Landform: Plain

Soils: Pale Brow / Clay loam sandy

Field observation and notes: None

Landzone: 5

RE code changes

Existing RE code: Cleared

Proposed RE code: Non-remnant

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 47 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-11

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310043 N 6961465

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	10 - 17	
T2	2	2 - 3	
T3		-	
S1		-	
S2		-	
G	0.3	0.1 - 0.5	

Structural formation: (including height)

Woodland

Ecologically dominant layer: T2

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T2	D	Callitris glaucophylla
T2	C	Acacia leiocalyx
T2	A	Allocasuarina luehmannii
T1	A	Eucalyptus crebra
G	A	Aristida ramosa
G	A	Dichanthium sericeum
G	A	Eragrostis elongata
G	A	Sida hackettiana
G	A	Eriachne mucronata
G	A	Hibiscus sturtii

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy plains and plateaus

Land system:

Landform: Plain

Soils: Pale Brow / Clay loam sandy

Field observation and notes: None

Landzone: 5

RE code changes

Existing RE code: Cleared

Proposed RE code: Non-remnant

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 48 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-12

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310043 N 6962173

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.3	0.1 - 0.5	M

Structural formation: (including height)

Ecologically dominant layer:

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	D	Aristida caput-medisae
G	C	Melines repens
G	A	Eragrostis elongata
G	A	Dichanthium sericeum
G	A	Hypochaeris albiflora
G	A	Opuntia tomentosa

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: C Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Dark brown / Silty clay loam

Field observation and notes: Firebreak zone

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: Cleared

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 48 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-12

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310043 N 6962173

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.3	0.1 - 0.5	M

Structural formation: (including height)

Ecologically dominant layer:

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	D	Aristida caput-medisae
G	C	Melines repens
G	A	Eragrostis elongata
G	A	Dichanthium sericeum
G	A	Hypochaeris albiflora
G	A	Opuntia tomentosa

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: C Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Dark brown / Silty clay loam

Field observation and notes: Firebreak zone

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: Cleared

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 49 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-12

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0309915 N 6962325

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.3	0.1 - 0.5	M

Structural formation: (including height)

Ecologically dominant layer:

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	D	Aristida caput-medisae
G	C	Melines repens
G	A	Eragrostis elongata
G	A	Dichanthium sericeum
G	A	Hypochaeris albiflora
G	A	Opuntia tomentosa

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy plains and plateaus

Land system:

Landform: Plain

Soils: Dark brown / Silty clay loam

Field observation and notes: Improved pasture

Landzone: 5

RE code changes

Existing RE code: 11.5.4 pre-cleared Gov layer

Proposed RE code: Cleared

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 50 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-09

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0309955 N 6962461

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	18	17 - 20	V
T1	10	8 - 15	M
T2		-	
T3		-	
S1	1	1 - 2	V
S2		-	
G	0.3	0.1 - 0.5	S

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Acacia leiocalyx
T1	A	Corymbia clarksoniana
E	A	Eucalyptus crebra
T1	A	Eucalyptus crebra
T1	A	Callitris glaucophylla
T2	A	Eucalyptus crebra
T2	A	Acacia leiocalyx
T2	A	Callitris glaucophylla
E	A	Angophora leicarpa
S1	A	Acacia leiocalyx

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Dark brow / clay laom sandy

Field observation and notes: None

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 51 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-09

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310048 N 6962662

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	18	17 - 20	V
T1	10	8 - 15	M
T2		-	
T3		-	
S1	1	1 - 2	V
S2		-	
G	0.3	0.1 - 0.5	S

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Acacia leiocalyx
T1	A	Corymbia clarksoniana
E	A	Eucalyptus crebra
T1	A	Eucalyptus crebra
T1	A	Callitris glaucophylla
T2	A	Eucalyptus crebra
T2	A	Acacia leiocalyx
T2	A	Callitris glaucophylla
E	A	Angophora leicarpa
S1	A	Acacia leiocalyx

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Dark brow / clay laom sandy

Field observation and notes: None

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 52 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-09

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310524 N 6962665

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	18	17 - 20	V
T1	10	8 - 15	M
T2		-	
T3		-	
S1	1	1 - 2	V
S2		-	
G	0.3	0.1 - 0.5	S

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Acacia leiocalyx
T1	A	Corymbia clarksoniana
E	A	Eucalyptus crebra
T1	A	Eucalyptus crebra
T1	A	Callitris glaucophylla
T2	A	Eucalyptus crebra
T2	A	Acacia leiocalyx
T2	A	Callitris glaucophylla
E	A	Angophora leicarpa
S1	A	Acacia leiocalyx

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Dark brow / clay laom sandy

Field observation and notes: None

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 53 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-09

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0309998 N 6963010

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	18	17 - 20	V
T1	10	8 - 15	M
T2		-	
T3		-	
S1	1	1 - 2	V
S2		-	
G	0.3	0.1 - 0.5	S

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Acacia leiocalyx
T1	A	Corymbia clarksoniana
E	A	Eucalyptus crebra
T1	A	Eucalyptus crebra
T1	A	Callitris glaucophylla
T2	A	Eucalyptus crebra
T2	A	Acacia leiocalyx
T2	A	Callitris glaucophylla
E	A	Angophora leicarpa
S1	A	Acacia leiocalyx

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Dark brow / clay laom sandy

Field observation and notes: None

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 55 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-13

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310076 N 6963341

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	16	15 - 19	M
T2	6	6 - 12	S
T3		-	
S1	1	1 - 2	V
S2		-	
G	0.3	0.1 - 0.5	V

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	C	Callitris glaucophylla
T1	A	Allocasuarina luehmanni
T2	A	Eucalyptus crebra
T2	A	Callitris glaucophylla
T2	A	Allocasuarina luehmanni
T2	A	Acacia leiocalyx
S1	A	Acacia leiocalyx
G	A	Aristida caput-medisae
G	A	Cymbopogon refractus

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy plains and plateaus

Land system:

Landform: Plain

Soils: Pale Brown / clay laom sandy

Field observation and notes: None

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 54 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-13

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310478 N 6963525

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	16	15 - 19	M
T2	6	6 - 12	S
T3		-	
S1	1	1 - 2	V
S2		-	
G	0.3	0.1 - 0.5	V

Structural formation: (including height)

Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	C	Callitris glaucophylla
T1	A	Allocasuarina luehmanni
T2	A	Eucalyptus crebra
T2	A	Callitris glaucophylla
T2	A	Allocasuarina luehmanni
T2	A	Acacia leiocalyx
S1	A	Acacia leiocalyx
G	A	Aristida caput-medisae
G	A	Cymbopogon refractus

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Tertiary-early Quaternary loamy and sandy plains and plateaus

Land system:

Landform: Plain

Soils: Pale Brown / clay laom sandy

Field observation and notes: None

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 56 **Recorder:** Thiago Moura **Day/Date:** 06 Mar 2024

Purpose Extension of biodiversity values confirmed in EFS - BRP1-09

Locality: (inc. distance/direction to nearest town) Approx 10km Northwest of Cecil Plains, QLD.

GPS: UTM Zone 56 E 0310379 N 6962162

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	18	17 - 20	V
T1	10	8 - 15	M
T2		-	
T3		-	
S1	1	1 - 2	V
S2		-	
G	0.3	0.1 - 0.5	S

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Acacia leiocalyx
T1	A	Corymbia clarksoniana
E	A	Eucalyptus crebra
T1	A	Eucalyptus crebra
T1	A	Callitris glaucophylla
T2	A	Eucalyptus crebra
T2	A	Acacia leiocalyx
T2	A	Callitris glaucophylla
E	A	Angophora leicarpa
S1	A	Acacia leiocalyx

Geology, landform, soils

Geology map/scale/year: NA

Geology code and rock types: Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Dark brow / clay laom sandy

Field observation and notes: None

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

North face of transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

LynTip-RE5

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 02 May 2024

Purpose Extension of biodiversity values confirmed in EFS Lyn-Tip-03

Locality: (inc. distance/direction to nearest town) Approx 20km southeast of Cecil Plains, QLD.

GPS: GDA2020 Zone 56 E 0310395 N 6965968

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	5	4 - 10	M
T2	2	2 - 4	S
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.3	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T2

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1		Eucalyptus decorticans
T1		Eucalyptus crebra
T1		Allocasuarina luehmannii
T1		Callitris glaucophylla
T2		Acacia leiocalyx
T2		Eucalyptus decorticans
S1		Acacia leiocalyx
S1		

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Dark Brown / Clay loam sandy

Field observation and notes:

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

RE 1

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetrjs 1-RE1

Site No.	**Recorder:** NAZIM UDDIN	**Day/Date:**	22.07.2024
Purpose	Ecological site Assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0310309 N 6965875		

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3	3	2 - 4	V
S1	1·5	1 - 2	V
S2		-	
G	0·4	0·1 - 0·7	V

Structural formation: (including height) Woodland (3m)

Ecologically dominant layer: T2

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; ***s*** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T3	a	Acacia leicalyx/S1
T3	a	E. crebra
T3	a	Callitris glaucophylla/S1
S1	a	Acacia spp.
G	a	Aristida caput-medusae
G	a	Chrysanthes speberi
G	a	Enteleja stricta
G	a	Melinis ripens
G	a	Panicum spp.
G	a	Chrysocephalum apiculatum
G	a	Aania aspera

* No specific species dominant

Geology, landform, soils

Geology map/scale/year:	
Geology code and rock types:	
Land system:	woody shrubland
Landform:	flat plain
Soils:	Sandy loam soil
Field observation and notes:	disturbed zone with regrowth along the existing track, photos: 7021-24
Landzone:	07

RE code changes

Existing RE code:	Non-remnant
Proposed RE code:	Undist. Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE3

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris1-RE8

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 23.07.2024

Purpose Ecological site Asse

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0308776 N 6965713

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	19	16 - 22	S
T2	13	10 - 16	S
T3	7	9 - 10	S
S1	1.5	1 - 2	S
S2		-	
G	04	01 - 07	S

Structural formation: (including height) Woodland (19 m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; ***s*** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. crebra.
T1	c	Callitris glaucophylla
T2	s	Budgeroo (Lysicarpus angustifolius
T2	s	Callitris glaucophylla
T	s	E. crebra.
S1	a	Acacia conferta
G	a	Aristida caput-medusae
G	a	Panicum spp.
G	a	Eragrostis spp.
G	a	Melinis repens
G		Cheilanthes sieberi

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy clay loam soil

Field observation and notes: Roadside vegetation, no soil crack, Photos: 7168-7171 **Landzone:** 07

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 1

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris 1 - RE9

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 24.07.2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0309400 N 6976542

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	20	18 - 22	S
T2	12	10 - 14	✓
T3	4	2 - 6	S
S1	1.5	1 - 2	✓
S2		-	
G	0.4	0.1 - 0.7	S

Structural formation: (including height)

Woodland (20m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. Woollsiana
T2	a	E. "
T1	c	E. crebra
T2	a	E. crebra
T2	a	C. citriodora glaucophylla/T3/S2
T3	a	Allocasuarina luehmannii/S2
T3	a	Alphitonia excelsa
G	a	Aristida caput-medusae
G	a	Panicum spp.
G	a	Cheilanthes sieberi
G	a	Walwhalleya subxerophila

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: flat to gently undulating plain

Soils: Sandy clay loam

Field observation and notes: E. woolliana dominated vegetation, Scattered Soil cracks, photos: 7215-18 **Landzone:** 05

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.5.1

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 2

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris 1-RE10

Site No.	**Recorder:** Nazim Udoh	**Day/Date:**	24/07/2024
Purpose	Ecological site Assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0309294 N 6964559		

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	19	16 - 22	S
T2	11	8 - 14	V
T3	4	2 - 6	S
S1	1.5	1 - 2	S
S2		-	
G	0.4	0.1 - 0.7	S

Structural formation: (including height) Woodland (19m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. woollsiana
T2	a	"
T3	a	Allocasuarina luehmannii /S2
T3	a	"
T2	a	celtis glanophylla/S2
T3	a	"
G	a	Waltheria subxerophila
G	a	Aristida caput-medusae
G	a	Panicum decompositum
G	a	Cleistochloa sieberi

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat to gently undulating plain

Soils: Sandy clay loam

Field observation and notes: Scattered soil cracks, photos: 7232-35

Landzone: 05

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 3

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris - RE 11

Site No.	**Recorder:** Nazim Uddin	**Day/Date:** 24.07.2021	
Purpose	Ecological site Assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0309665	N 6964294	

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E		-	
T1	20	18 - 22	M
T2	11	8 - 14	S
T3	6	4 - 8	S
S1	1.5	1 - 2	S
S2		-	
G	0.5	0.1 - 0.9	S

Structural formation: (including height) Woodland (20 m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. crebra
T2	c	"
T2	a	Brachychiton luehmannii
S1	a	"
T3	a	callitris glaucophylla
		Aristida caput-medusae
		Walwhalleya subxerophila
		Dianella spp.
		Cheilanthes sieberi
		Bradyscone spp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland.

Landform: Flat to gently undulating plains

Soils: Sand clay loam

Field observation and notes: Eucrebra dominated vegetation. No soil crack, photos: 7249 - 52 **Landzone:** 05

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE64

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 06 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR41

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0300056 N 6965576

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	9 - 17	S
T2	6	2 - 8	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	C	Eucalyptus moluccana
T1	A	Acacia glaucocarpa
T1	A	Lysicarpus angustifoloius
T1	A	Angophora leiocarpa
T2	A	Melaleuca decora
T2	A	Eucalyptus moluccana
T2	A	Lysicarpus angustifoloius
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: MISCELLANEOUS UNCONSOLIDATED SEDIMENTS

Land system:

Landform: Plain

Soils: Brown pale sandy loam soil

Field observation and notes: No habitat feature for grey snake

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1 Regrowth

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

RE 4

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris 1- RE12

Site No. **Recorder:** Nazim Uddin **Day/Date:** 24.07.2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0310085 N 6964463

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	18	14 - 22	S
T2	8	6 - 10	S
T3	4	2 - 6	S
S1	1.5	1 - 2	S
S2		-	
G	0.5	0.1 - 0.9	S

Structural formation: (including height)

Woodland (18m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d = dominant; ***c*** = co-dominant; **s** - subdominant, ***a*** – associated

Str.	Rel. dom.	Scientific Name
T1	d	E. crebra
T2	c	"
T3	a	Budgeroo or Lysicarpus angustifolius
T3	a	Acacia leiocalyx
T1	a	"
T2	a	Callitris glaucophylla
Gr	a	Cheilanthes sieberi
Gr	a	Cockiria adpora
Gr	a	Dianella caerulea
Gr	a	Alphitonia excelsa
Gr		Aristida caput-medusae
Gr		Panicum decompositum

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: woodland -

Landform: flat

Soils: Sandy clay loam

Field observation and notes: Photos: 7262-56 - 69, 7262-65

no soil cracks

Landzone: 07

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE5

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris 1 - RE 13

Site No. **Recorder:** Nazim Uddin **Day/Date:** 24.07.2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0310158 N 6956170

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	18	16 - 20	M
T2	10	8 - 12	S
T3	4	2 - 6	S
S1	1.5	1 - 2	S
S2		-	
G	0.4	0.1 - 0.7	S

Structural formation: (including height) Woodland (18 m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. crebra
T2	c	"
T3	a	"
T3	a	Callitris glaucophylla
S1	a	Acacia leiocalyx
S1	a	Acacia spectabilis
G	a	Aristida caput medusae
G	a	Panicum spp.
G	a	Cheilanthes sieberi
G	a	Cenchrus aspera

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland.

Landform: Flat land

Soils: Sandy clay loam

Field observation and notes: No soil cracks

Photos: 7266 - 69

Landzone: 07

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 6

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris 1 - RE14

Site No.	**Recorder:** Nazim Uddin	**Day/Date:**	24.07.2024
Purpose	Ecological site Assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0328835 N 6965437		

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	7	6 - 8	S
T2		-	
T3	3	2 - 4	S
S1	1.5	1 - 2	S
S2		-	
G	0.4	0.1 - 0.7	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum; ***d*** = dominant; ***c*** = co-dominant; ***s*** = subdominant, ***a*** = associated.

Str.	Rel. dom.	Scientific Name
T1	d	Allocasuarina luehmannii
T3	c	"
T1	c	Callitris glaucophylla
T1	a	E. crebra
T1	a	E. moellsiana
T1	a	Lysicarpus angustifolius
T3	a	"
Gr	a	Cheilanthes sieberi
Gr	a	Chrysocephalum apiculatum
Gr	a	Aristida ramo. medusae
Gr	a	Panicum spp.
Gr	a	Eragrostis spp.
Gr	a	Melinis repens

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: woodland

Landform: Flat

Soils: Sand clay loam

Field observation and notes: T1: Callitris glaucophylla: High percentage dieback. photos: 7270-73 **Landzone:** 07

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4 regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 7

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris1-RE 15

Site No. **Recorder:** Nazim Uddin **Day/Date:** 24.06.2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0308730 N 6964528

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	3	2 - 4	M
T2		-	
T3		-	
S1	1·3	1 - 2	S
S2		-	
G	0·4	0·1 - 0·7	M

Structural formation: (including height)

Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; ***s*** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	Allocasuarina luehmannii
S1	c	"
T1	a	E. crebra
T1	c	"
S1	a	Acacia spp.
G	a	Aristida conjuncta
G	a	Panicum spp.
G	a	Chrysopogon fallax
G	a	Dichanthium sericeum
G	a	Cenchrus setigerus
G	a	Sporobolus spp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland.

Landform: Flat plain

Soils: Sandy clay loam

Field observation and notes: High trees are died, No Soil crack. Photos: 7293-96 **Landzone:** 05

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 8

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris 1 - RE 16

Site No.	**Recorder:** Nazim Uddin	**Day/Date:**	24.07.2024
Purpose	Ecological site Assessment.		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0308586	N 6953830	

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E		-	
T1	4	2 - 6	
T2		-	
T3		-	
S1	1.5	1 - 2	
S2		-	
G		0.1 - 0.7	

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	a	Lysicarpus angustifolius
T1	d	E. crebra
S1	a	"
S1	a	E. chlorocladus
G	a	Aristida spp.
G	a	fomicum "
G	a	cheilanthes sieberi
G	a	Bianella spp.
G	a	Eriochloa spp.

Geology, landform, soils

Geology map/scale/year:	
Geology code and rock types:	
Land system:	Woodland.
Landform:	Flat plain
Soils:	Sandy loam
Field observation and notes:	completely burnt zone.
Photos: 7318-21	**Landzone:** 05

RE code changes

Existing RE code:	11.5.1 (3D), 11.5.4 (Gouf.)
Proposed RE code:	11.7.4 Regrowth.

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

KS1

Koala Survey Datasheet

Site: Tetris1-KS3	Date: 24.07.2024	Lat: 309312	Long: 6964682
Vegetation community description: E. woollsiana dominated vegetation. RE 11.5.1			

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. E. woollsiana	20
2. E. crebra	5
3. Callitris glaucophylla	5
4. Casuarina luehmannii	10
5.	
6.	
Total Canopy Cover:	40
Vegetation ground cover (% of the ground area):	60
Leaf litter cover (% of the ground area):	20
Bare ground cover (% of the ground area):	20
Area of surface water (% of the ground area):	N/A
Distance (m) to surface water:	N/A
Evidence of dogs in the area?	NO
Evidence of scratches/scats (type and age)?	NO

photos. 7228 – 31

North face of the transect

East face of the transect

South face of the transect

West face of the transect

KS 2

KS 4

Koala Survey Datasheet

Site: Tetris1 - KS4	Date: 24.07.2024	Lat: 3094 60	Long: 6964424
Vegetation community description: RE 11.5.1			

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. E. crebra	10
2. Allocasuarina luehmannii	12
3. Callitris glaucophylla	5
4. Acacia leiocalyx	3
5.	
6.	
Total Canopy Cover:	30
Vegetation ground cover (% of the ground area):	55
Leaf litter cover (% of the ground area):	20
Bare ground cover (% of the ground area):	25
Area of surface water (% of the ground area):	NO
Distance (m) to surface water:	N/A
Evidence of dogs in the area?	NO
Evidence of scratches/scats (type and age)?	NO

photos: 7245-48

North face of the transect

East face of the transect

South face of the transect

West face of the transect

(RE1)

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris 1 - RE17

Site No.	**Recorder:** Nazim Uddin	**Day/Date:**	25.07.2024
Purpose	Ecological site Assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0307919	N 6965282	

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E		-	
T1	5	4 - 6	S
T2		-	
T3	3	2 - 4	S
S1	1.5	1 - 2	S
S2		-	
G	0.4	0.1 - 0.7	S

Structural formation: (including height) Woodland (5m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum; ***d*** – dominant; ***c*** – co-dominant; ***s*** - subdominant, ***a*** – associated

Str.	Rel. dom.	Scientific Name
E		*Callitris glaucophylla
T1	a	Allocasuarina luehmannii
T1	a	Budgeroo
T1	d	Acacia leiocalyx/S1/T2
T1	a	Angophora leiocarpa
T1	a	E. exchora
G	a	solanum spp.
G	a	Aristida caput-medusae
G	a	Dianella
G	a	Eragrostis spp.
G	a	Chelanthes sieberi

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat to gently undulating plains

Soils: Sandy loam

Field observation and notes: *died due to recent fire, no soil crack

photo: 7376-79 **Landzone:** 05

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE2

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris 1-RE18

Site No.	**Recorder:** Nazim Uddin	**Day/Date:**	25.07.2024
Purpose	Ecological site Assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0307605 N 6964293		

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	17	12 - 22	S
T2	9	6 - 12	S
T3	4	2 - 6	S
S1	1.5	1 - 2	S
S2		-	
G	0.4	01-07	S

Structural formation: (including height) Woodland (17m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d = dominant; ***c*** = co-dominant; **s** = subdominant, ***a*** = associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. crebra
T1	c	Cal. hrs. glaucophylla
T2	s	"
T3	s	Acacia leiocalyx
S1	a	Alphitonia excelsa
S1	a	Cheilanthes sieberi
G	a	Cyanthillium cinereum
G	a	Panicum spp.
G	a	Aristida capillacea
G	a	Dianella longifolia
G	a	Rahlia exserta
G	a	Chrysocephalum apiculatum
G	a	Solanum spp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat to gently undulating plains

Soils: Sandy loam soil

Field observation and notes: Photos: 7395-98, no soil cracks. Recently burnt

Landzone: 05

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE3

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris 1- RE19

Site No. ____ **Recorder:** Nakim Uddin **Day/Date:** 25.07.2024

Purpose Ecological site Assessment.

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0306292 N 6964382

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	11	10 - 12	
T1		-	
T2		-	
T3	4	2 - 6	M
S1	1.5	1 - 2	S
S2		-	
G	0.4	0.1 - 0.7	S

Structural formation: (including height) woodland

Ecologically dominant layer: T3

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
E	a	E. crebra
T3	d	Acacia leiocalyx
S1	c	"
S1	a	Alphitonia excelsa
G	a	Eragrostis spp.
G	a	Panicum decompositum
G	a	Chrysopogon fallax
G	a	Melinis repens
G	a	Chrysocephalum apiculatum

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland.

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: Eucalyptus, Acacia leiocalyx dominated. Photo: 7428-31. **Landzone:** 07

RE code changes

Existing RE code: 11.7.4 (3D)

Proposed RE code: 11.7.4 (Regrowth)

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE4

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris 1 - RE 20

Site No.	**Recorder:** Nazim Uddin	**Day/Date:**	25.07.2024
Purpose	Ecological site Assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0305679	N 6964788	

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	6	4 - 8	S
T2		-	
T3	3	2 - 4	S
S1		1 - 2	S
S2		-	
G	0'4	0'1 - 07	S

Structural formation: (including height) Woodland (6m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T_1	c	E. crebra
T_1	d	Acacia leiocalyx
T_2	c	"
S_1	a	"
T_1	a	Budgeroo
T_1	a	E. spp.
G	a	cheilanthes sieberi
G	a	Aristida capud. mutica
G	a	Panicum spp.
G	a	chloris spp.
G	a	Melinis ripens

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Ward Land.

Landform: Flat plain

Soils: Sandy loam.

Field observation and notes: Burnt zone, Acacia leiocalyx dominated soil, rocks, photos: 7448-51 **Landzone:** 07

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 5

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris 1 - RE 21

Site No.	**Recorder:** Nazim Uddin	**Day/Date:** 25.07.2024	
Purpose	Ecological Site Assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56	E 0306699	N 6965609

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E		-	
T1	25	22 - 28	S
T2	12	10 - 14	S
T3		-	
S1	1.5	1 - 2	S
S2		-	
G	0.4	0.1 - 0.7	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
T1	d	Angophora leiocarpa
T2	a	Angustifolius (bradleyi)
T2	a	Melaleuca
T2	a	Callitris glaucophylla
S1	a	Acacia spp
G	a	Aristida caput-medusae
G	a	Panicum spp.
G	a	Melinis repens
G	a	Cyanthillium spp.
G	a	Lomandra sp

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland.

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: Photos 7471-74

Landzone: 05

RE code changes

Existing RE code: 11.7.4 (3D) / 11.5.4 (GUV)

Proposed RE code: 11.5.4

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RG 1

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris 1 – RE 22

Site No.	**Recorder:** Nazim Uddin	**Day/Date:**	26.07.2024
Purpose	Ecological site Assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0307210	N 6965630	

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E		-	
T1	7	4 - 10	S
T2		-	
T3		-	
S1	1.5	1 - 2	M
S2		-	
G	0.4	0.1 - 0.7	S

Structural formation: (including height) Woodland.

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum; ***d*** – dominant; ***c*** – co-dominant; ***s*** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	E. crebra
T1	C	Angophora leiocarpa/S1
T1	C	calitris glaucophylla/S1
T1	C	Acacia leiocalyx/S1
T1	C	Budgeroo/S1
G	A	Dichelachne spp
G	a	Aristida conjuta-ramosissima
G	a	Galenia asperia
G	a	Panicum spp.
G	a	Chrysocephalum apiculatum
G	a	Cheilanthes sieberi

Geology, landform, soils

Geology map/scale/year:	
Geology code and rock types:	
Land system:	Woodland.
Landform:	Flat plain
Soils:	Sand loam
Field observation and notes:	Photos: 7500-7503, burnt area regrowth area.
Landzone:	05

RE code changes

Existing RE code:	11.5.1 (a1)
Proposed RE code:	11.5.1 Regrowth

END

* Mostly died due to fire and other reasons.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE2

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetrist - RE23

Site No.	**Recorder:** Nazim Uddin	**Day/Date:**	26.07.2024
Purpose	Ecological site Assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0306380 N 6945897		

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	13	12 - 14	✓
T1	7	6 - 8	M
T2		-	
T3		-	
S1	1.5	1 - 2	S
S2		-	
G	0.5	01 - 0.9	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
E	a	E. crebra
E	a	Callitris glaucophylla ✓
E	a	Melaleuca / Eucalyptus
T1	d	Acacia leiocalyx
S1	c	✓
G	a	Alphitonia excelsa
G	a	Imperata cylindrica
G	a	Cheilanthes sieberi
G	a	Portulaca oleracea
G	a	Chrysocephalum apiculatum

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil cracks, sandy loam

P.Obs: 752r_27 **Landzone:** 07

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 3

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris 1 – RE 24

Site No.	**Recorder:** Nazim Uddin	**Day/Date:**	26.07.2024
Purpose	Ecological site Assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0305301 N 6965631		

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	10 - 12	S
T2		-	
T3	3	2 - 4	S
S1	1.5	1 - 2	S
S2		-	
G	0.5	0.1 - 0.3	S

Structural formation: (including height) Woodland (11m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; ***s*** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1		E. tereticornis
T1		Angophora leiocarpa
T1		Melaleuca decora
T		Brachychiton
T3		Acacia leiocalyx s1
T1		Eucalyptus glaucophylla
G		Aristida caput-medusae
G		Chrysocephalum apiculatum
G		Paspalum dilatatum
G		Melinis repens

* Nothing is dominant. Every species is scattered

Geology, landform, soils

Geology map/scale/year:	
Geology code and rock types:	
Land system:	Woodland.
Landform:	Flat plain
Soils:	Sandy loam
Field observation and notes:	Regrowth Area.
	photos: 7550 – 53 **Landzone:** 07

RE code changes

Existing RE code:	11.7.4 (3D)
Proposed RE code:	11.7.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Koala Survey Datasheet

56J

Site: Telrg1-KS5	Date: 26.07.2024	Lat: 307219	Long: 6965537

Vegetation community description:
E. crebra dominated vegetation
RE 11.5.1

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. E. crebra	10
2. Allocasuarina luehmannii	7
3. Lysicarpus angustifolius	3
4. Callitris glaucophylla	5
5. Acacia leiocalyx	5
6.	
Total Canopy Cover:	30
Vegetation ground cover (% of the ground area):	30
Leaf litter cover (% of the ground area):	30
Bare ground cover (% of the ground area):	40
Area of surface water (% of the ground area):	N/A
Distance (m) to surface water:	N/A
Evidence of dogs in the area?	NO
Evidence of scratches/scats (type and age)?	NO

photos: 7516-19

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE25

Site No. _____ **Recorder:** Nazim Uddin **Day/Date:** 05/08/2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0305084 N 6964990

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	4	2-6	V
T2		-	
T3			
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (04m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. chloroclada
T1	a	E. crebra
T1	a	Allocasuarina luehmannii/S1
T1	a	Angophora leiocarpa
S1	a	Melaleuca spp./Acacia inophloia
G	a	Lomandra paten/Ghania aspera
G	a	Panicum decompositum
G	a	Cheilanthes sieberi
G	a	Dianella spp./Aristida caput-medusae
G	a	Chrysocephalum apiculatum

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: Fired zone, high die back, no soil crack

Photos:7642-7645 **Landzone:** 05

RE code changes

Existing RE code: 11.5.4 (3D)

Proposed RE code: 11.5.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE26

Site No. _____ **Recorder:** Nazim Uddin **Day/Date:** 05/08/2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0305053 N 6964383

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	7	4-10	S
T2		-	
T3			
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (07m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	Lysicarpus angustifolius
T1	a	E. crebra
T1	a	E. chloroclada
S1	a	Acacia leiocalyx
S1	a	Acacia conferta
G	a	Ghania aspera
G	a	Panicum decompositum
G	a	Cheilanthes sieberi
G	a	*Xanthorrhoea australis*
G	a	Chrysocephalum apiculatum

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: Fired zone, high die back, no soil crack

Photos:7661-7664 **Landzone:** 07

RE code changes

Existing RE code: 11.5.4 (3D) and 11.7.4/11.7.7 (Govt. Map)

Proposed RE code: 11.7.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE27

Site No. _____ **Recorder:** Nazim Uddin **Day/Date:** 05/08/2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0304735 N 6963795

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	7	4-10	S
T2		-	
T3			
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (07m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. crebra/E. chloroclada/S1
T1	a	Lysicarpus angustifolius/S1
T1	a	Allocasuarina luehmannii/S1
T1	a	Acacia leiocalyx/S1
G	a	Dianella caerulea
G	a	Ghania aspera
G	a	Panicum decompositum
G	a	Cheilanthes sieberi
G	a	Solanum spp.
G	a	Chrysocephalum apiculatum

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil crack

Photos:7675-7678 **Landzone:** 05

RE code changes

Existing RE code: 11.5.4 (3D)

Proposed RE code: 11.5.4

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE54

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 05 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR36

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0304845 N 6965567

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	8	7 - 10	S
T2	4	2 - 6	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T2

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T2	C	Melaleuca decora
T2	A	Callitris glaucophylla
T2	A	Eucalyptus moluccana
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa
S1	A	Hakea purpurea

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Brown pale clayey sand soil

Field observation and notes: No habitat feature for grey snake

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE55

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 05 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR36

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0303999 N 6965543

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	8	7 - 10	S
T2	4	2 - 6	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T2

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T2	C	Melaleuca decora
T2	A	Callitris glaucophylla
T2	A	Eucalyptus moluccana
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa
S1	A	Hakea purpurea

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Brown pale clayey sand soil

Field observation and notes: No habitat feature for grey snake

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE56

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 05 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR36

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0303644 N 6965482

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	8	7 - 10	S
T2	4	2 - 6	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T2

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T2	C	Melaleuca decora
T2	A	Callitris glaucophylla
T2	A	Eucalyptus moluccana
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa
S1	A	Hakea purpurea

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Brown pale clayey sand soil

Field observation and notes: No habitat feature for grey snake

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE57

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 05 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR36

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0303231 N 6965599

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	8	7 - 10	S
T2	4	2 - 6	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T2

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T2	C	Melaleuca decora
T2	A	Callitris glaucophylla
T2	A	Eucalyptus moluccana
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa
S1	A	Hakea purpurea

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: Cainozoic duricrusts

Land system:

Landform: Plain

Soils: Brown pale clayey sand soil

Field observation and notes: No habitat feature for grey snake

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE58

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 05 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR41

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0302236 N 6965509

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	9 - 17	S
T2	6	2 - 8	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	C	Eucalyptus moluccana
T1	A	Acacia glaucocarpa
T1	A	Lysicarpus angustifoloius
T1	A	Angophora leiocarpa
T2	A	Melaleuca decora
T2	A	Eucalyptus moluccana
T2	A	Lysicarpus angustifoloius
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: MISCELLANEOUS UNCONSOLIDATED SEDIMENTS

Land system:

Landform:

Soils: Sandy and, red sandy soil, silt and some gravel

Field observation and notes: No habitat feature for grey snake

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE59

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 05 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR38

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0299262 N 6965591

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	9 - 17	S
T2	6	2 - 8	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus moluccana
T1	C	Melaleuca decora
T1	A	Callitris glaucophylla
T2	A	Eucalyptus moluccana
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: MISCELLANEOUS UNCONSOLIDATED SEDIMENTS

Land system:

Landform: Plain

Soils: Brown pale sandy loam soil

Field observation and notes: No habitat feature for grey snake

Landzone: 5

RE code changes

Existing RE code: 11.5.20

Proposed RE code: 11.5.20

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE60

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 05 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR38

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0299262 N 6965591

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	9 - 17	S
T2	6	2 - 8	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus moluccana
T1	C	Melaleuca decora
T1	A	Callitris glaucophylla
T2	A	Eucalyptus moluccana
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: MISCELLANEOUS UNCONSOLIDATED SEDIMENTS

Land system:

Landform: Plain

Soils: Brown pale sandy loam soil

Field observation and notes: No habitat feature for grey snake

Landzone: 5

RE code changes

Existing RE code: 11.5.20

Proposed RE code: 11.5.20

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE28

Site No. _____ **Recorder:** Nazim Uddin **Day/Date:** 06/08/2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0303427 N 6964933

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	13	10-16	S
T2		-	
T3	4	2-6	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (13m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	Lysicarpus angustifolius/T3
T1	a	E. chloroclada/T3
T1	a	Eucalyptus spp.
T3	a	Acacia leiocalyx/S1
G	a	Acacia spp.
G	a	Ghania aspera
G	a	Panicum decompositum/Aristida spp.
G	a	Cheilanthes sieberi
G	a	Solanum spp.
G	a	Chrysocephalum apiculatum

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil crack

Photos:7702-7705 **Landzone:** 07

RE code changes

Existing RE code: 11.7.4 (3D)

Proposed RE code: 11.7.4

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE29

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 06/08/2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0303427 N 6964933

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	10	8-12	S
T2		-	
T3	4	2-6	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (10m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	*C*	E. crebra/T3
T1	d	Allocasuarina luehmannii/T3
T1	a	Calitris glaucophyllla/T3
T3	a	Melaleuca spp./T3
G	a	Acacia spp.
G	a	Ghania aspera
G	a	Panicum decompositum/Aristida spp.
G	a	Cheilanthes sieberi
G	a	Glandularia artistigera
G	a	Chrysocephalum apiculatum

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil crack, Allocasurina dominated vegetation

Photos:7746-7749 **Landzone:** 05

RE code changes

Existing RE code: 11.7.4 (3D) and 11.5.1/11.5.20/11.5.4 (Govt. map)

Proposed RE code: 11.5.1

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE30

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 06/08/2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0302862 N 6964044

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	10-12	S
T2	8	6-10	S
T3	4	2-6	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (11m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. crebra/T2/T3
T1	d	Allocasuarina luehmannii/T3
T1	c	Calitris glaucophyllla/T3
T3	a	Melaleuca spp./T3
G	a	Acacia spp.
G	a	Ghania aspera
G	a	Aristida spp./Entolasia stricta
G	a	Cheilanthes sieberi
G	a	Glandularia artistigera
G	a	Chrysocephalum apiculatum

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil crack, E. crebra with Calitris dominated vegetation

Photos:7764-7767 **Landzone:** 05

RE code changes

Existing RE code: 11.7.4 (3D) and 11.5.1/11.5.20/11.5.4 (Govt. map)

Proposed RE code: 11.5.1

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE31

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 06/08/2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0303434 N 6963014

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	14-16	S
T2	8	6-10	S
T3	4	2-6	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (15m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. crebra/T2/T3
T1	a	Angophora leiocarpa/T3
T1	a	Calitris glaucophyllla/T3
T1	a	Lysicarpus angustifolius/T3
S	a	Acacia leiocalyx
S	a	Grevillea spp.
G	a	Entolasia stricta
G	a	Cheilanthes sieberi
G	a	Ghania aspera
G	a	Aristida caput-medusae

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil crack, E. crebra with Calitris dominated vegetation

Photos:7785-7788 **Landzone:** 07

RE code changes

Existing RE code: 11.7.4 (3D)

Proposed RE code: 11.7.4

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Koala Survey Datasheet

Site: Tetris-KS6	Date: 06.08.2024	Lat: 303069	Long: 696409 E
Vegetation community description: E. crebra dominated vegetation. RE 11.5.1			

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. E. crebra	20
2. callitris glaucophylla	10
3. Allocasuarina luehmannii	5
4. Acacia spp.	5
5.	
6.	
Total Canopy Cover:	40
Vegetation ground cover (% of the ground area):	40
Leaf litter cover (% of the ground area):	20
Bare ground cover (% of the ground area):	40
Area of surface water (% of the ground area):	NO
Distance (m) to surface water:	NA
Evidence of dogs in the area?	NO
Evidence of scratches/scats (type and age)?	NO

photos: 7765-71

Spot Assessment Technique (Phillips & Callaghan 2011).

Number of trees with Koala scats beneath (within 1m of tree base)	N/A
Total number of trees surveyed	30
Proportion of trees with Koala scats beneath	N/A

Were any Koalas observed? If so, record where possible…

Koala's sex:	
Koala's disease status:	
Koala's reproductive status:	
Tree species:	
Tree height:	
Tree DBH:	

Photograph log.

Photo number	Description

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE61

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 05 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR41

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0298665 N 6965508

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	9 - 17	S
T2	6	2 - 8	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	C	Eucalyptus moluccana
T1	A	Acacia glaucocarpa
T1	A	Lysicarpus angustifoloius
T1	A	Angophora leiocarpa
T2	A	Melaleuca decora
T2	A	Eucalyptus moluccana
T2	A	Lysicarpus angustifoloius
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: MISCELLANEOUS UNCONSOLIDATED SEDIMENTS

Land system:

Landform: Plain

Soils: Brown pale sandy loam soil

Field observation and notes: No habitat feature for grey snake

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE62

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 06 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR41

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0298457 N 6965521

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	9 - 17	S
T2	6	2 - 8	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	C	Eucalyptus moluccana
T1	A	Acacia glaucocarpa
T1	A	Lysicarpus angustifoloius
T1	A	Angophora leiocarpa
T2	A	Melaleuca decora
T2	A	Eucalyptus moluccana
T2	A	Lysicarpus angustifoloius
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: MISCELLANEOUS UNCONSOLIDATED SEDIMENTS

Land system:

Landform: Plain

Soils: Brown pale sandy loam soil

Field observation and notes: No habitat feature for grey snake

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE63

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 06 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR41

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0300480 N 6964635

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	9 - 17	S
T2	6	2 - 8	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	C	Eucalyptus moluccana
T1	A	Acacia glaucocarpa
T1	A	Lysicarpus angustifoloius
T1	A	Angophora leiocarpa
T2	A	Melaleuca decora
T2	A	Eucalyptus moluccana
T2	A	Lysicarpus angustifoloius
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: MISCELLANEOUS UNCONSOLIDATED SEDIMENTS

Land system:

Landform: Plain

Soils: Brown pale sandy loam soil

Field observation and notes: No habitat feature for grey snake

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE65

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 06 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR41

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0300860 N 6965585

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	9 - 17	S
T2	6	2 - 8	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	C	Eucalyptus moluccana
T1	A	Acacia glaucocarpa
T1	A	Lysicarpus angustifoloius
T1	A	Angophora leiocarpa
T2	A	Melaleuca decora
T2	A	Eucalyptus moluccana
T2	A	Lysicarpus angustifoloius
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: MISCELLANEOUS UNCONSOLIDATED SEDIMENTS

Land system:

Landform: Plain

Soils: Brown pale sandy loam soil

Field observation and notes: No habitat feature for grey snake

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE66

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 06 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR41

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0301610 N 6965585

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	9 - 17	S
T2	6	2 - 8	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	C	Eucalyptus moluccana
T1	A	Acacia glaucocarpa
T1	A	Lysicarpus angustifoloius
T1	A	Angophora leiocarpa
T2	A	Melaleuca decora
T2	A	Eucalyptus moluccana
T2	A	Lysicarpus angustifoloius
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: MISCELLANEOUS UNCONSOLIDATED SEDIMENTS

Land system:

Landform: Plain

Soils: Brown pale sandy loam soil

Field observation and notes: No habitat feature for grey snake

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE67

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 06 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR41

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0301674 N 6964799

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	9 - 17	S
T2	6	2 - 8	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	C	Eucalyptus moluccana
T1	A	Acacia glaucocarpa
T1	A	Lysicarpus angustifoloius
T1	A	Angophora leiocarpa
T2	A	Melaleuca decora
T2	A	Eucalyptus moluccana
T2	A	Lysicarpus angustifoloius
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: MISCELLANEOUS UNCONSOLIDATED SEDIMENTS

Land system:

Landform: Plain

Soils: Brown pale sandy loam soil

Field observation and notes: No habitat feature for grey snake

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Tetris1-RE68

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 06 Sep 2024

Purpose Biodiversity values confirmed on EFS Tetris 1-TR41

Locality: (inc. distance/direction to nearest town) Approx 40 km Northeast of Dalby, QLD.

GPS: GDA2020 Zone 56 E 0301260 N 6964878

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	9 - 17	S
T2	6	2 - 8	M
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	C	Eucalyptus moluccana
T1	A	Acacia glaucocarpa
T1	A	Lysicarpus angustifoloius
T1	A	Angophora leiocarpa
T2	A	Melaleuca decora
T2	A	Eucalyptus moluccana
T2	A	Lysicarpus angustifoloius
T2	A	Acacia glaucocarpa
S1	A	Acacia glaucocarpa

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: MISCELLANEOUS UNCONSOLIDATED SEDIMENTS

Land system:

Landform: Plain

Soils: Brown pale sandy loam soil

Field observation and notes: No habitat feature for grey snake

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE32

Site No. _____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0306343 N 6963397

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	14-16	S
T2	7	4-10	S
T3	3	2-4	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (15m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. crebra/T2/T3
T1	a	E. chloroclada/T3
T1	c	Calitris glaucophyllla/T3
T3	a	Acacia conferta/S1
T3	a	Acacia leiocalyx/S1
G	a	Grevillea spp.
G	a	Aristida caput-medusae
G	a	Cheilanthes sieberi
G	a	Ghania aspera
G	a	Melinis ripens/Eragrostis spp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil crack, E. crebra with Calitris dominated vegetation along the access track

Photos:7799-7802 **Landzone:** 05

RE code changes

Existing RE code: 11.5.4 (3D)

Proposed RE code: 11.5.4

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE33

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0306258 N 6962835

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	9	6-12	S
T2			S
T3	4	2-6	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (09m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. crebra*/T3
T1	a	*E. chloroclada*/T3
T1	c	*Angophora leiocarpa*/T3
T1	a	*Lysicarpus angustifolius*/T3
S1	a	*Allocausrina leuhmannii*
G	a	*Walwhalleya subxerophila*
G	a	*Aristida caput-medusae*
G	a	*Cheilanthes sieberi*
G	a	*Ghania aspera/Eragrostis spp.*
G	a	*Melinis ripens*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil crack, E. crebra with E. chloroclada dominated vegetation along the access track

Photos:7803-7806, burnt zone **Landzone:** 07

RE code changes

Existing RE code: 11.7.4 (3D)

Proposed RE code: 11.7.4

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE34

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0306271 N 6962610

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	6	4-8	V
T2			
T3	3	2-4	M
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (06m)

Ecologically dominant layer: T3

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. crebra*/T3
T1	c	*Melaleuca decora*/T3/S1
T1	a	*E. chloroclada* /T3
T3	a	*Lysicarpus angustifolius*
T3	a	*Allocausrina leuhmannii/S1*
S1	a	*Acacia spp.*
G	a	*Aristida caput-medusae*
G	a	*Cheilanthes sieberi/Dodonaea spp.*
G	a	*Ghania aspera/Eragrostis spp.*
G	a	*Melinis ripens*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil crack, E. crebra with Melaleuca dominated vegetation along the access track

Photos:7807-7810, it is a burnt zone, regrowth **Landzone:** 07

RE code changes

Existing RE code: 11.7.4 (3D)

Proposed RE code: 11.7.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE35

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0305696 N 6962656

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	9	8-10	S
T2			
T3	5	2-8	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (09m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	Corymbia trachyphloia/T3
T1	c	*Lysicarpus angustifolius*/T3
T1	a	*E. chloroclada* /T3
T1	a	Calitris glaucophylla/T3
T1	a	*E. chloroclada/T3*
S1	a	*Acacia leiocalyx*
G	a	*Aristida caput-medusae*
G	a	*Cheilanthes sieberi/Chrysocephalum apiculatum*
G	a	*Ghania aspera/Eragrostis spp.*
G	a	*Melinis ripens*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil crack, Corymbia with Budgeroo dominated vegetation along the access track

Photos: 7811-7814 **Landzone:** 07

RE code changes

Existing RE code: 11.7.4 (3D)

Proposed RE code: 11.7.4

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE36

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0305047 N 6962695

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	10-12	S
T2			
T3	4	2-6	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (11m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*Allocasuarina luehmannii*/T3
T1	a	*E. crebra*/T3
T1	c	*Calitris glaucophylla*/T3
S1	a	*Acacia leiocalyx*
S1	a	*Acacia spp.*
G	a	*Cheilanthes sieberi*
G	a	*Aristida caput-medusae*
G	a	*Chrysocephalum apiculatum*
G	a	*Ghania aspera/Eragrostis spp.*
G	a	*Melinis ripens/Panicum decompositum*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil crack, Allocasuarina dominated vegetation along the access track

Photos:7815-7818 **Landzone:** 05

RE code changes

Existing RE code: 11.5.4 (3D)

Proposed RE code: 11.5.4

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE37

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0304699 N 6962801

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1			
T2			
T3	4	2-6	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (4m)

Ecologically dominant layer: T3

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T3	d	*E. crebra/S1*
T3	c	*Allocasuarina luehmannii/S1*
T3	c	E. chloroclada/S1
T3	a	*Melaleuca spp./S1*
S1	a	*Acacia spp.*
G	a	*Cheilanthes sieberi*
G	a	*Aristida caput-medusae*
G	a	*Chrysocephalum apiculatum*
G	a	*Ghania aspera/Eragrostis spp.*
G	a	*Melinis ripens/Panicum decompositum*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil crack, E. crebra dominated vegetation along the access track

Photos: 7819-7822,burnt area **Landzone:** 05

RE code changes

Existing RE code: 11.5.4 (3D)

Proposed RE code: 11.5.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE38

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0306952 N 6962405

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	13	12-14	V
T2	4	2-6	
T3			S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (4m)

Ecologically dominant layer: T2

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. crebra*/T2
T1	c	*Calitris glaucophylla*/T2
T1	a	Eucalyptus spp. /T2
S1	a	*Alphitonia excelsa*
S1	a	*Acacia leiocalyx*
G	a	*Cheilanthes sieberi*
G	a	*Aristida caput-medusae*
G	a	*Chrysocephalum apiculatum*
G	a	*Melinis ripens*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil crack, E. crebra with calitris dominated vegetation along the access track

Photos:7823-7826, burnt area **Landzone:** 07

RE code changes

Existing RE code: 11.7.4 (3D)

Proposed RE code: 11.7.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE39

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0307495 N 6962375

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	8	6-10	V
T2			
T3	3	2-4	M
S1	1.5	1-2	M
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (3m)

Ecologically dominant layer: T3

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. crebra*/T3/S1
T3	a	*Acacia leiocalyx/S1*
S1	a	*Alphitonia excelsa*
G	a	*Cheilanthes sieberi*
G	a	*Aristida caput-medusae*
G	a	*Chrysocephalum apiculatum*
G	a	*Melinis ripens*
G	a	*Gahnia aspera*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plain

Soils: Sandy loam

Field observation and notes: No soil crack, E. crebra (shrub) dominated vegetation along the access track

Photos:7829-7832, completely burnt area **Landzone:** 05

RE code changes

Existing RE code: 11.5.1 (3D)

Proposed RE code: 11.5.1 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE40

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0308061 N 6962236

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	8	6-10	V
T2			
T3	3	2-4	M
S1	1.5	1-2	M
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (3m)

Ecologically dominant layer: T3

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. crebra*/T3/S1
T3	a	*Allocasuarina luehmannii*
S1	a	*Acacia leiocalyx*
S1	c	*Alphitonia excelsa*
G	a	*Cheilanthes sieberi*
G	a	*Aristida caput-medusae*
G	a	*Chrysocephalum apiculatum*
G	a	*Melinis ripens*
G	a	*Gahnia aspera*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat to gently undulating plains

Soils: Sand

Field observation and notes: No soil crack, completely burnt area

Photos:7833-7836 **Landzone:** 05

RE code changes

Existing RE code: 11.5.1 (3D)

Proposed RE code: 11.5.1 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE41

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0308571 N 6962201

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	8	6-10	V
T2			
T3	3	2-4	M
S1	1.5	1-2	M
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (3m)

Ecologically dominant layer: T3

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. crebra*/T3/S1
T3	a	*Allocasuarina luehmannii*
T3	a	*Acacia leiocalyx/S1*
S1	c	*Alphitonia excelsa*
G	a	*Walwhalleya subxerophila*
G	a	*Cheilanthes sieberi*
G	a	*Aristida caput-medusae*
G	a	*Chrysocephalum apiculatum*
G	a	*Melinis ripens*
G	a	*Gahnia aspera*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat to gently undulating plains

Soils: Sandy loam

Field observation and notes: No soil crack, completely burnt area

Photos:7837-7840 **Landzone:** 05

RE code changes

Existing RE code: 11.5.1 (3D)

Proposed RE code: 11.5.1 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE42

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0309222 N 6962050

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	14-16	S
T2	8	6-10	S
T3	4	2-6	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (15m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. crebra/T2/T3*
T1	a	*Lysicarpus angustifolius/T3*
T1	a	*Calitris glaucophylla/T3*
T3	a	*Alphitonia excelsa/S1*
S1	a	*Acacia leiocalyx*
G	a	*Cheilanthes sieberi*
G	a	*Aristida caput-medusae*
G	a	*Chrysocephalum apiculatum*
G	a	*Melinis ripens/ Walwhalleya subxerophila*
G	a	*Gahnia aspera*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plains

Soils: Sandy loam

Field observation and notes: No soil crack, completely burnt area

Photos:7841-7844 **Landzone:** 07

RE code changes

Existing RE code: 11.7.4 (3D)

Proposed RE code: 11.7.4

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE43

Site No. _____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0309819 N 6962014

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	9	8-10	V
T2			
T3	4	2-6	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (9m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. crebra*/T3
T1	a	*Lysicarpus angustifolius/T3*
T1	a	*Corymbia trachyphloia /T3*
S1	a	*Alphitonia excelsa*
G	a	*Cheilanthes sieberi*
G	a	*Aristida caput-medusae*
G	a	*Walwhalleya subxerophila*
G	a	*Melinis ripens*
G	a	*Gahnia aspera*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plains

Soils: Sandy loam

Field observation and notes: No soil crack, completely burnt area

Photos:7845-7848 **Landzone:** 07

RE code changes

Existing RE code: 11.7.4 (3D)

Proposed RE code: 11.7.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE44

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0309886 N 6961548

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	9	8-10	V
T2			
T3	4	2-6	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (9m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*Lysicarpus angustifolius/T3*
T1	a	*Corymbia trachyphloia /T3*
S1	a	*Alphitonia excelsa*
G	a	*Cheilanthes sieberi*
G	a	*Aristida caput-medusae*
G	a	*Melinis ripens*
G	a	*Gahnia aspera*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plains

Soils: Sandy loam

Field observation and notes: No soil crack, completely burnt area, scattered T1, high dieback

Photos:7849-7852 **Landzone:** 07

RE code changes

Existing RE code: 11.7.4 (3D)

Proposed RE code: 11.7.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE45

Site No. _____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0309924 N 6960895

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	9	8-10	V
T2			
T3	4	2-6	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (9m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*Angophora leiocarpa/T3*
T1	a	*Corymbia trachyphloia /T3*
S1	a	*Alphitonia excelsa*
G	a	*Cheilanthes sieberi*
G	a	*Aristida caput-medusae*
G	a	*Melinis ripens*
G	a	*Gahnia aspera*
G	a	*Eragrostis spp.*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plains

Soils: Sand

Field observation and notes: No soil crack, completely burnt area, scattered T1, high dieback

Photos:7853-7856 **Landzone:** 05

RE code changes

Existing RE code: 11.5.4 (3D)

Proposed RE code: 11.5.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE46

Site No. _____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0309907 N 6960263

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	10-12	S
T2			
T3	4	2-6	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (11m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. crebra/T3*
T1	a	*Corymbia trachyphloia /T3*
T1	a	*Calitris glaucophylla/T3*
T3	a	Acacia leiocalyx/S1
S1	a	*Alphitonia excelsa*
G	a	*Cheilanthes sieberi*
G	a	*Aristida caput-medusae*
G	a	*Melinis ripens*
G	a	*Gahnia aspera*
G	a	*Eragrostis spp.*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plains

Soils: Sandy loam

Field observation and notes: No soil crack, partially burnt area

Photos:7857-7860 **Landzone:** 07

RE code changes

Existing RE code: 11.7.4 (3D)

Proposed RE code: 11.7.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE47

Site No. _____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0309934 N 6959510

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	10-12	S
T2			
T3	4	2-6	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (11m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. chloroclada/T3*
T1	a	*Angophora leiocarpa /T3*
T1	a	*Calitris glaucophylla/T3*
T3	a	Acacia leiocalyx/S1
S1	a	*Alphitonia excelsa*
S1	a	*Acacia conferta*
G	a	*Aristida caput-medusae*
G	a	*Melinis ripens/ Cheilanthes sieberi*
G	a	*Eragrostis spp.*
G	a	*Gahnia aspera*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plains

Soils: Sandy loam

Field observation and notes: No soil crack

Photos:7861-7864 **Landzone:** 05

RE code changes

Existing RE code: 11.5.4 (3D)

Proposed RE code: 11.5.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE48

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0310032 N 6958637

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	13	12-14	S
T2			
T3	4	2-6	S
S1	1.5	1-2	M
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (13m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. crebra/T3*
T1	a	*Angophora leiocarpa /T3*
T1	a	*Calitris glaucophylla/T3*
T3	a	Acacia leiocalyx/S1
S1	a	*Alphitonia excelsa*
S1	a	*Acacia conferta*
G	a	*Aristida caput-medusae*
G	a	*Melinis ripens/ Cheilanthes sieberi*
G	a	*Eragrostis spp.*
G	a	*Gahnia aspera/Solanum spp*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plains

Soils: Sandy loam

Field observation and notes: No soil crack

Photos:7865-7868 **Landzone:** 05

RE code changes

Existing RE code: 11.7.4 (3D) and 11.5.4 (Govt. map)

Proposed RE code: 11.5.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE49

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0310321 N 6957845

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	10-12	V
T2	6	4-8	S
T3	4	2-4	S
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (6m)

Ecologically dominant layer: T2

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. crebra/T2/T3/S1*
T1	a	*E. chloroclada /T2*
T1	a	*Calitris glaucophylla/T2*
S1	a	Acacia leiocalyx
S1	a	*Alphitonia excelsa*
G	a	*Aristida caput-medusae*
G	a	*Melinis ripens*
G	a	*Cheilanthes sieberi*
G	a	*Gahnia aspera*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plains

Soils: Sandy loam

Field observation and notes: No soil crack, high crebra regrowth after burning, T1 dieback high

Photos:7871-7874 **Landzone:** 05

RE code changes

Existing RE code: 11.7.4 (3D) and 11.5.4 (Govt. map)

Proposed RE code: 11.5.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE50

Site No. _____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0310388 N 6957489

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	14	12-16	S
T2	5	4-6	M
T3			
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (5m)

Ecologically dominant layer: T2

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	c	*E. crebra/T2*
T1	a	Angophora leiocarpa/T2
T2	d	Acacia leiocalyx/S1
S1	a	*Alphitonia excelsa*
G	a	*Aristida caput-medusae*
G	a	*Melinis ripens*
G	a	*Cheilanthes sieberi*
G	a	*Gahnia aspera*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plains

Soils: Sandy loam

Field observation and notes: No soil crack, Acacia leiocalyx dominated vegetation

Photos: 7875-7878 **Landzone:** 05

RE code changes

Existing RE code: 11.7.4 (3D) and 11.5.4 (Govt)

Proposed RE code: 11.5.4 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE51

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0310512 N 6957388

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	14	12-16	S
T2	4	2-6	M
T3			
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (14m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. crebra/T2*
T2	c	Acacia leiocalyx/S1
T2	a	*Acacia conferta/S1*
S1	a	*Alphitonia excelsa*
G	a	*Dianella caerulea*
G	a	*Solanum spp.*
G	a	*Aristida caput-medusae*
G	a	*Melinis ripens*
G	a	*Cheilanthes sieberi*
G	a	*Gahnia aspera*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat plains

Soils: Sandy loam

Field observation and notes: No soil crack, E. crebra with Acacia leiocalyx dominated vegetation

Photos:7879-7882 **Landzone:** 07

RE code changes

Existing RE code: 11.7.4 (3D)

Proposed RE code: 11.7.4

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location: Tetris1-RE52

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 07/08/2024

Purpose Ecological Site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0310911 N 6957417

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	13	10-16	S
T2			
T3			
S1	1.5	1-2	S
S2		-	
G	0.5	0.1-0.9	S

Structural formation: (including height)

Woodland (13m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	*E. populnea*
T1	a	E. crebra
S1	a	*Acacia leiocalyx*
G	a	*Acacia salicina*
G	a	*Dianella caerulea*
G	a	*Gahnia aspera*
G	a	*Aristida caput-medusae*
G	a	*Melinis ripens*
G	a	*Cheilanthes sieberi*
G	a	*Opuntia stricta*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat to gently undulating plains

Soils: Sandy loam

Field observation and notes: No soil crack, E. populnea dominated vegetation along the road reserve

Photos:7887-7890 **Landzone:** 05

RE code changes

Existing RE code: 11.5.1a (3D)

Proposed RE code: 11.5.1

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 5

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Tetris1 - RE5

Site No. ..... Recorder: NAZIM UDDIN Day/Date: 22.07.2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0310656 N 6965454

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	14	12 - 16	S
T2	10	8 - 12	S
T3	4	2 - 6	S
S1	1.5	1 - 2	S
S2		-	
G	0.4	0.1 - 0.7	M

Structural formation: (including height) Woodland (14 m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum; *d* – dominant; *c* – co-dominant; **s** - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
T1	D	E. crebra
T2	c	E crebra
T3	C	callitris glaucophylla
S1	a	"
S1	a	Acacia leiocalyx
S1	a	Acacia conferta
G	a	Fimbristylis dichotoma
G	a	Panicum decompositum
G	a	Entolasia stricta
G	a	Aristida caput-medusae
G		Heteranthus sieberi
S1	a	Ozothamnus diosmifolius

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat to gently undulating plains

Soils: Sandy loam

Field observation and notes: No soil crack,

photos: 7050-53 Landzone: 05

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

KS1

Koala Survey Datasheet

Site: Tetris1-KS1	Date: 22.07.2024	Lat: 310314	Long: 6965546
Vegetation community description: E. crebra with E. woollsiana dominated vegetation; RE 11.5.1			

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. E. crebra	20
2. E. woollsiana	10
3. Allocasuarina luehmannii	5
4. Callitris glaucophylla	3
5. Acacia leiocalyx	2
6.	
Total Canopy Cover:	40
Vegetation ground cover (% of the ground area):	10
Leaf litter cover (% of the ground area):	55
Bare ground cover (% of the ground area):	35
Area of surface water (% of the ground area):	NA
Distance (m) to surface water:	NA
Evidence of dogs in the area?	NO
Evidence of scratches/scats (type and age)?	NO

photos: 7070-73

North face of the transect

East face of the transect

South face of the transect

West face of the transect

KS1

Koala Survey Datasheet

Site: Tetris1-KS2	Date: 23.07.2024	Lat: 309778	Long: 6965352
Vegetation community description: E. crebra dominated vegetation. Field valided RE 11.5.1			

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. E. crebra.	30
2. E. moolsiana.	10
3. Callitris glaucophylla	2
4. Casuarina luehmannii	1
5.	
6.	
Total Canopy Cover:	43
Vegetation ground cover (% of the ground area):	60
Leaf litter cover (% of the ground area):	20
Bare ground cover (% of the ground area):	20
Area of surface water (% of the ground area):	NA
Distance (m) to surface water:	NA
Evidence of dogs in the area?	NO
Evidence of scratches/scats (type and age)?	NO

photos: 7155 - 58

North face of the transect

East face of the transect

South face of the transect

West face of the transect

VCRV

Draft

Environment Department

ENVIRONMENTAL FIELDWORK SHEET (EFS)

Site Identification

Site Name:	Dunmun gravel pit	Date:	08/05/2011
Site / Waypoint Number:	11	Assessor/s:	Leanne Stevens, Al Cole

Development Type and Location

Development type				Location description	
Production Well Site	☐	Gas Processing Facility	☐	Easting	311455.7
Pilot Well + Dam	☐	Dam	☐	Northing	6164566.8
Core/Chip Hole	☐	Pipeline	☐	Datum + zone	GDA94, zone 52
Frac well	☐	Seismic Line	☐	Other description	Gravel pit
SIS well	☐	Roads	☐		
Well pad	☐	Other	☒		

Photo numbers and notes

Camera used Leanne's

A	763 - transect	E	
B		F	
C		G	
D		H	

Landform within 300m

Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

Physiography (ESU)

Slope	Level (<1%)	(Very gently inclined (1-3%))	Gently inclined (3-10%)	Mod. inclined (10-32%)				
	Steep (32-55%)	Very steep (56-100%)	Precipitous (100-299%)	Cliffed (>300%)				
Aspect	N	S	(E)	W	NE	(NW)	SE	SW	Nil
Geology	Alluvial	Clay	Sand	(Coarse sedimentary)	Fine sedimentary				
	Igneous (coarse)	Volcanic (fine)	Metamorphic	Limestone	Laterite				
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Texture	Clay	Silt	(Loam)	Sand	Gravel	Saline mud			
Erosion	Absent		(Scattered)		Frequent				
Erosion Type	Tunnelling	(Sheet)	Rill	Gully	Mass failure	Stream-bank			
Soil / Erosion notes	light brown - grey in colour with some outcropping								

Disturbance (ESU)

Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	(Thinning)	Comment:	
Weeds	Absent	(Scattered)	Frequent	Dominant			
Declared Weeds							
Dieback	0%	1-25%	(26-75%)	>76%			
Site condition	Very good	(Good)	Moderate	Poor	Degraded		
Fire scars	(Absent)	Scattered	Frequent	Time since	Recent	Old	Average Height (m)
Disturbance notes							

Vegetation structure and content (ESU)

Dominant growth form	Closed forest	(Open forest)	Woodland	Shrubland	Grassland	Forbland	Wetland
Growth stage	Senescent	(Uneven age)	Mature	Advanced regeneration	Early regeneration		
Ecologically dominant layer (EDL)	(T1)	T2	S1	S2	G		
Median height (m) of EDL	2.2m	Median DBH (cm) of canopy species		148mm			
% Crown cover	>70%	(30-70%)	10-30%	<10%			
Mid-storey density	Absent	Sparse	(Dense)	Very dense			
Remnant status	Remnant	(High value regrowth)	Non-remnant	Other			
Landscape state	Intact	(Variegated)	Fragmented	Relictual			
Condition notes							

Tertiary Flora Assessment (ESU)

	RE Code	EPBC Status	VMA Status	Biodiversity Status
RE as mapped	Non-Remnant			
Survey result	Non-Remnant			
Agree w/ mapped RE?	Yes.			
If no, provide reasons				

Vegetation floristics (record all woody spp. in top 10 ps cover in ground stratum within 20m x 20m quadrat)

Sub-stratum	Growth form	Field name	Species name	Cover	Abundance	Field No.
	T2	Acacia, large phyllodes	Acacia salicina	41	3.	
	T2		Callitris glaucophylla	2	32.	
			Eucalyptus sleberi	5	1000.	
			Aristida caput-medusae	5	1000.	
	S1		Callitris glaucophylla	41	3	
	T2.		Eucalyptus tetrodonta	41	1	
			Aristida ramosa	10	200.	
	S1		Acacia	41	3.	
		E grass	Enneapogon	2	50.	
			Themeda triandra	41	100	
			Enneapogon nigricans	2	20.	
			Cassia [illegible] aruana	41	1	
			Triodia epactia	5	100.	
			Eragrostis dielsiana	41	5	
			[illegible] E. brownii	2	20.	
			Laxmania	41	5	
	S2		Callitris glaucophylla	0	0	
	Seedling		Callitris glaucophylla	0	0	
	S2		Acacia	0.	0.	
	Seedling		Acacia	41	17	
			Tarlium effusum	41	5	

Growth form	T=tree; M=mallee tree; S=shrub; Z=heath shrub; C=chenopod shrub; G=tussock grass; H=hummock grass; D=sod grass; V=vine; R=rush; K=fern; F=forb; A=cycad; P=palm; X=xanthorrhoea; U=samphire shrub, O=other
Cover	Crown cover measured in the following categories <1%; 1%; 2%; 3%; 4%; 5%; 10%; 15%; 20%; 25%; 30%; 35%; 40% etc
Abundance	Number of individuals measured in the following categories 1; 2; 3; 4; 5; 6; 7; 8; 9; 10, 20; 50; 100, 500; 1000; >1000

Rehabilitation

*Baseline rehabilitation state	1. Annual groundcover or cultivation	2. Perennial exotic groundcover	3. Perennial native groundcover	4. Native vegetation remnant
Progress	Not yet undertaken	Satisfactory		Unsatisfactory
Notes on rehabilitation concerns with regard to soil erosion, vegetation cover establishment, landform contouring, contamination.				

* record the original site condition as the goal for future rehabilitation works.

Type A Restricted Plants (timed search across ESU)

Restricted plants	Species	No.	Coordinates					
			Easting	Northing	Easting	Northing	Easting	Northing
Orchidaceae sp. (orchids)								
Xanthorrhoea sp. (Grass trees)								
Myrmecodia sp. (Ant plants)								
Hydnophytum sp. (Ant plants)								
Cycadaceae sp. (Cycads)								
Zamiaceae sp. (Cycads)								
Huperzia sp. (lace plants)								
Platycerium sp. (Staghorns)								
Brachychiton sp. (Bottle trees)								
Livistona sp. (Cabbage palms)								

Threatened Flora (timed search across ESU)

Threatened Flora Species		No.	Coordinates					
			Easting	Northing	Easting	Northing	Easting	Northing

Other points of interest (e.g. track/infrastructure locations, additional flora sp.) (across ESU)

Description / notes	Coordinates		Photo number
	Easting	Northing	

Groundcover monitoring (100m transect)

Location	Dunbroon Gravel Pit	Survey name	Plot number	Recorders
Date	04/05/2012	DGP	1	Leanne Stevens, Alex Cole
Grid Reference	Zone: 54 55 (56)	Datum	Transect Start (0m): E / N	Transect end (100m): E / N
Transect length	100m	Orientation: 253°	Marked: Yes (No)	Photo # / orientation: 763

Ground Cover	Tally (first point of contact) every 1m along 100m transect (=100 points)	Total
Litter	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸	44
Bare ground	𝍸	5
Cryptogram	𝍸 𝍸 𝍸 𝍸	14
Woody debris		
Rock		
Exotic – Annual		
Exotic – Perennial		
Shrub (crown height <1m)	I	1
Grass – Hummock*		
Grass – Other*	𝍸 𝍸 𝍸 𝍸 𝍸 III	28
Forb*	I	1
Sedge / Rush*		
Fern*	𝍸 IIII	9
Other*		

* Native species

Belt transect for woody species (100m x 5m belt transect)

Woody flora species observed	Form	Relative Dominance	Tally: T1 layer	T2 layer	S1 layer	Seedlings
Callitris			II	𝍸 III	𝍸 I	I
Acacia				IIII	𝍸	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸
Eucalyptus				𝍸 I		
Acacia 2				I	I	

Species annotations	S=specimens collected; *=Exotic species; **=Declared species; +=Outside but adjoining plot
Form	T=Tree; S=Shrub; Seed=Seedling; Sap=Sapling
Relative dominance	D=Dominant; A=Abundant; F=Frequent; O=Occasional; R=Rare
Abbreviations	N/A=Not Applicable; N/R=Not Recorded; N/O=None Observed

Blackwood - 9
Cumbungan not tracked.
Melaleuca -
Aphidanthera excelsa.

Fauna Habitat Assessment (within ESU)

No. of trees/ha with hollows (>10cm)	3	No. of hollow logs/ha	2	Total length of logs/ha (>10cm)	600m	No. of logs/ha (>10cm)	12.0

Habitat feature	Status			
Cliffs / outcrops	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Leaf litter	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Seeding grass cover	Absent	Scattered	Common	Abundant
Fleshy fruiting plants	Absent	Scattered	Common	Abundant
Nectar / pollen	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Waterway	Absent	Scattered	Common	Abundant
Wetland / Swamp / Waterbody	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

Fauna Signs (within ESU)

Scats/pellets/ food remains	Absent	Scattered	Common	Abundant
Animal tracks / trails	Absent	Scattered	Common	Abundant
Bones, feathers	Absent	Scattered	Common	Abundant
Diggings / burrows	Absent	Scattered	Common	Abundant
Shelters / nests	Absent	Scattered	Common	Abundant
Tree scratches / feed scars	Absent	Scattered	Common	Abundant

Incidental Fauna Sightings and Breeding Places (within ESU)

Species Name	Conservation Status	Breeding Place (eg. nests, hollows, logs, peeling bark)	Coordinates		Other Information (eg. Growth stage, number of individuals)
			Eastings	Northings	

Conservation Status

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species
LC	Least Concern

Special Least Concern Species

Koala, Echidna, Platypus, Migratory Species

Colonial Breeding Species

"a group of animals of the same kind co-existing in close association for breeding purposes"

Eg. Frogs, Microbats, Babblers, Apostlebirds, etc.

VCR

[redacted]

Draft

Environment Department

ENVIRONMENTAL FIELDWORK SHEET (EFS)

Site Identification

Site Name:	Dunham Gravel Pit 22	Date:	08/05/2012
Site / Waypoint Number:	22	Assessor/s:	Leanne Stevens, M. Tobe

Development Type and Location

Development type				Location description	
Production Well Site	☐	Gas Processing Facility	☐	Easting	313119
Pilot Well + Dam	☐	Dam	☐	Northing	6964714
Core/Chip Hole	☐	Pipeline	☐	Datum + zone	GDA94, Zone 50
Frac well	☐	Seismic Line	☐	Other description	Gravel Pit
SIS well	☐	Roads	☐		
Well pad	☐	Other	☒		

Photo numbers and notes

Camera used Leanne 5

A	764	E	
B		F	
C		G	
D		H	

Landform within 500m

Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

Physiography (ESU)

Slope	Level (<1%)	Very gently inclined (>1-3%)	Gently inclined (>3-10%)	Mod. inclined (>10-32%)				
	Steep (32-55%)	Very steep (56-100%)	Precipitous (100-299%)	Cliffed (>300%)				
Aspect	(N)	S	E	W	NE	NW	SE	SW	Nil
Geology	Alluvial	Clay	Sand	(Coarse sedimentary)	Fine sedimentary				
	Igneous (coarse)	Volcanic (fine)	Metamorphic	Limestone	Laterite				
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	(Grey)	Pale	Dark	Mottled				
Texture	Clay	Silt	(Loam)	Sand	Gravel	Saline mud			
Erosion	Absent		(Scattered)		Frequent				
Erosion Type	Tunnelling	(Sheet)	Rill	Gully	Mass failure	Stream-bank			
Soil / Erosion notes									

Disturbance (ESU)

Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	(Logging)	(Thinning)	Comment:	
Weeds	Absent	(Scattered)			Frequent	Dominant	
Declared Weeds							
Dieback	0%	(1-25%)		26-75%	>76%		
Site condition	Very good	Good	(Moderate)	Poor	Degraded		
Fire scars	(Absent)	Scattered	Frequent	Time since	Recent	Old	Average Height (m)
Disturbance notes							

Vegetation structure and context (ESU)

Dominant growth form	Closed forest	(Open forest)	Woodland	Shrubland	Grassland	Forbland	Wetland
Growth stage	Senescent	(Uneven age)	Mature	Advanced regeneration	Early regeneration		
Ecologically dominant layer (EDL)	(T1)	T2	S1	S2	G		
Median height (m) of EDL	25m	Median DBH (cm) of canopy species					
% Crown cover	>70%	(30-70%)	10-30%	<10%			
Mid-storey density	Absent	Sparse	(Dense)	Very dense			
Remnant status	Remnant	(High value regrowth)	Non-remnant	Other			
Landscape state	Intact	(Variegated)	Fragmented	Relictual			
Condition notes							

Forestry Flora Assessment (ESU)

	RE Code	EPBC Status	VMA Status	Biodiversity Status
RE as mapped	Non-remnant			
Survey result	Non-remnant			
Agree w/ mapped RE?	Yes			
If no, provide reasons				

Vegetation notables (record all woody spp. and dom. ground cover in 20m x 20m quadrat)

Sub-stratum	Growth form	Field name	Species name	Cover	Abundance	Field No.
	T2		Acacia salicina	6	7	
			Chelanthes sieberi	2	300	
			[redacted]			
			Ansiida capitatomedusae	<1	10	
	T1		Callitris glaucophylla		7	
	T2		Callitris glaucophylla		5	
	S2		Callitris glaucophylla		1	
	Seedling	Blackwood	Callitris glaucophylla		3	
	S2		Acacia Salicina		2	
	Seedling		Acacia salicina		7	
			Chrysocephalum apiculatum	<1	10	
		blooms2	Eucalyptus blaxlandii			
			Ericaline aristidea	<1	10	
			Cassinia arcuata	<1	1	
			Enneapogon nigricans	<1	5	
			Panicum effusum	<1	5	
			Cymbopogon refractus	<1	1	
			Bromandra sp.	1	5	
			Calotis cuneifolia	<1	1	
			Exocarpos bidwillii	25	1000	
	T1		Eucalyptus camaldulensis		2	
			Nombistylis dichotoma	<1	5	

Growth form	T=tree; M=mallee tree; S=shrub; Z=heath shrub; C=chenopod shrub; G=tussock grass; H=hummock grass; D=sod grass; V=vine; R=rush; E=fern; F=forb; A=cycad; P=palm; X=xanthorrhoea; U=samphire shrub, O=other
Cover	Crown cover measured in the following categories <1%; 1%; 2%; 3%; 4%; 5%; 10%; 15%; 20%; 25%; 30%; 35%; 40% etc
Abundance	Number of individuals measured in the following categories 1; 2; 3; 4; 5; 6; 7; 8; 9; 10; 20; 50; 100; 500; 1000; >1000

Rehabilitation

*Baseline rehabilitation state	1. Annual groundcover or cultivation	2. Perennial exotic groundcover	3. Perennial native groundcover	4. Native vegetation remnant
Progress	Not yet undertaken	Satisfactory	Unsatisfactory	
Notes on rehabilitation concerns with regard to soil erosion, vegetation cover establishment, landform contouring, contamination.				

* record the original site condition as the goal for future rehabilitation works.

Type A Restricted Plants (timed search across ESU)

Restricted plants	Species	No.	Coordinates					
			Easting	Northing	Easting	Northing	Easting	Northing
Orchidaceae sp. (orchids)								
Xanthorrhoea sp. (Grass trees)								
Myrmecodia sp. (Ant plants)								
Hydnophytum sp. (Ant plants)								
Cycadaceae sp. (Cycads)								
Zamiaceae sp. (Cycads)								
Huperzia sp. (lace plants)								
Platycerium sp. (Staghorns)								
Brachychiton sp. (Bottle trees)								
Livistona sp. (Cabbage palms)								

Threatened Flora (timed search across ESU)

Threatened Flora Species	No.	Coordinates					
		Easting	Northing	Easting	Northing	Easting	Northing

Other plants of interest (trees/infrastructure/behaviour) additional to ESU (across ESU)

Description / notes	Coordinates		Photo number
	Easting	Northing	

Groundcover and other (100m transect)					
Location	Durrison gravel pit	**Survey name**	**Plot number**	**Recorders**	
Date	08/05/2012	DGP2	2	Leanne Stevens, Al Pike	
Grid Reference	**Zone**	**Datum**	**Transect Start (0m)**	**Transect end (100m)**	
	54 55 [✓ 56]	GDA94	E N	E N	
Transect length	100m	**Orientation**	184°	**Marked**	Yes [✓ No]
Photo # / orientation	764.				

Groundcover	**Tally (use points of contact (1m) every 1m along 100m transect (100 points))**	**Total**
Litter	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 |	46
Bare ground	𝍸 ||	7
Cryptogram		
Woody debris	𝍸	5
Rock		
Exotic – Annual		
Exotic – Perennial		
Shrub (crown height <1m)	|	1
Grass – Hummock*		
Grass – Other*	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 |||	38
Forb*	|	1
Sedge / Rush*		
Fern*	|||	3.
Other*		

* Native species

Belt transect for woody species (100m x 5m belt transect)						
Woody flora species observed	**Form**	**Relative Dominance**	**Tally**			
			T1 layer	**T2 layer**	**S1 layer**	**Seedlings**
Callitris			𝍸 𝍸 𝍸 ||	𝍸 𝍸 𝍸 𝍸 |	𝍸 ||	|
Acacia				||	|	|
~~Boxwood~~ E. blakelyi			|			
E. crebra			||	|		

Species annotations	S=specimens collected; *=Exotic species; **=Declared species; +=Outside but adjoining plot
Form	T=Tree; S=Shrub; Seed=Seedling; Sap=Sapling
Relative dominance	D=Dominant; A=Abundant, F=Frequent; O=Occasional; R=Rare
Abbreviations	N/A=Not Applicable; N/R=Not Recorded; N/D=None Observed

Fauna Habitat Assessment (Within ESU)

No. of trees/ha with hollows (>10cm)	1	No. of hollow logs/ha	5	Total length of logs/ha (>10cm)	80	No. of logs/ha (>10cm)	50

Habitat feature	Status			
Cliffs / outcrops	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Leaf litter	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Seeding grass cover	Absent	Scattered	Common	Abundant
Fleshy fruiting plants	Absent	Scattered	Common	Abundant
Nectar / pollen	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Waterway	Absent	Scattered	Common	Abundant
Wetland / Swamp / Waterbody	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

Fauna Sign (Within ESU)

Scats/pellets/ food remains	Absent	Scattered	Common	Abundant
Animal tracks / trails	Absent	Scattered	Common	Abundant
Bones, feathers	Absent	Scattered	Common	Abundant
Diggings / burrows	Absent	Scattered	Common	Abundant
Shelters / nests	Absent	Scattered	Common	Abundant
Tree scratches / feed scars	Absent	Scattered	Common	Abundant

Incidental Fauna Sightings and Breeding Places (Within ESU)

Species Name	Conservation Status	Breeding Place (eg. nests, hollows, logs, peeling bark)	Coordinates		Other Information (eg. Growth stage, number of individuals)
			Eastings	Northings	

Conservation Status

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species
LC	Least Concern

Special Least Concern Species
Koala, Echidna, Platypus, Migratory Species

Colonial Breeding Species
"a group of animals of the same kind co-existing in close association for breeding purposes"
Eg. Frogs, Microbats, Babblers, Apostlebirds, etc.

VCR ✓

[redacted]

Ecology Site Assessment Proforma

Draft

Environment Department

ENVIRONMENTAL FIELDWORK SHEET (EFS)

Site identification

Site Name:	Duntroon Gravel Pit 3.	Date:	09/05/2012
Site / Waypoint Number:	3.	Assessor/s:	Leanne Stevens.

Development type and location

Development type				Location description	
Production Well Site	☐	Gas Processing Facility	☐	Easting	310775.6.
Pilot Well + Dam	☐	Dam	☐	Northing	6765682.6.
Core/Chip Hole	☐	Pipeline	☐	Datum + zone	GDA94, zone 56.
Frac well	☐	Seismic Line	☐	Other description	Gravel pit
SIS well	☐	Roads	☐		
Well pad	☐	Other	☒		

Photo number/description

Camera used Leanne's

A		E	
B		F	
C		G	
D		H	

Land form within 100m

Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

Physiography (ESU)

Slope	Level (<1%)	Very gently inclined (>1-3%)	Gently inclined (>3-10%)	Mod. inclined (>10-32%)				
	Steep (32-55%)	Very steep (56-100%)	Precipitous (100-299%)	Cliffed (>300%)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Geology	Alluvial	Clay	Sand	Coarse sedimentary	Fine sedimentary				
	Igneous (coarse)	Volcanic (fine)	Metamorphic	Limestone	Laterite				
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Texture	Clay	Silt	Loam	Sand	Gravel	Saline mud			
Erosion	Absent			Scattered		Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			
Soil / Erosion notes									

Disturbance (ESU)

Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	Comment:
Weeds	Absent	Scattered	Frequent	Dominant		
Declared Weeds						
Dieback	0%	1-25%	26-75%	>76%		
Site condition	Very good	Good	Moderate	Poor	Degraded	
Fire scars	Absent	Scattered	Frequent	Time since	Recent	Old
Disturbance notes				Average Height (m)		

Vegetation Structure and Context (ESU)

Dominant growth form	Closed forest	Open forest	Woodland	Shrubland	Grassland	Forbland	Wetland
Growth stage	Senescent	Uneven age	Mature	Advanced regeneration	Early regeneration		
Ecologically dominant layer (EDL)	T1	T2	S1	S2	G		
Median height (m) of EDL	25m	Median DBH (cm) of canopy species		150mm			
% Crown cover	>70%	30-70%	10-30%	<10%			
Mid-storey density	Absent	Sparse	Dense	Very dense			
Remnant status	Remnant	High value regrowth	Non-remnant	Other			
Landscape state	Intact	Variegated	Fragmented	Relictual			
Condition notes							

Tertiary Flora Assessment (ESU)

	RE Code	EPBC Status	VMA Status	Biodiversity Status
RE as mapped	11.5.1/11.5.20	NC	LC	NOC
Survey result	11.5.1	NC	LC	NOC
Agree w/ mapped RE?	Yes			
If no, provide reasons				

Vegetation floristics (record all woody spp and for 10 spp cover for 20m x 20m quadrat)						
Sub-stratum	Growth form	Field name	Species name	Cover	Abundance	Field No.
			Aristida caput-medusae	5	50	
			Panicum effusum	5	50.	
			Eriachne aristidea	10	100	
			Aristida ramosa	1	10.	
			Calotis cuneifolia	1	20.	
			Eragrostis cumingii	10	100	
			Fimbristylis dichotoma	1	20.	
			Cheilanthes sieberi	1	50.	
			Portia tomentosa	<1	1	
			Eragrostis brownii	10	100.	
			Vittadinia dissecta	1	20	
		(Grass) Forb.	Eragrostis sp.	<1	5.	
			Cassinia [redacted] aculeata	<1	6	
Seedling T2			Acacia salicina	1	6	
			Callitris glaucophylla	2	5	
T2			Acacia salicina	5.	3	
T1			Eucalyptus ebbanoensis	10.	5	
T1			Callitris glaucophylla	<1	1	
			Lomandra sp.	<1	4	
		nigricans.	Enneapogon nigricans.	<1	5.	

Growth form	T=tree; M=mallee tree; S=shrub; Z=heath shrub; C=chenopod shrub; G=tussock grass; H=hummock grass; D=sod grass; V=vine; R=rush; E=fern; F=forb; A=cycad; P=palm; X=xanthorrhoea; U=samphire shrub, O=other
Cover	Crown cover measured in the following categories <1%; 1%; 2%; 3%; 4%; 5%; 10%; 15%; 20%; 25%; 30%; 35%; 40% etc
Abundance	Number of individuals measured in the following categories 1; 2; 3; 4; 5; 6; 7; 8; 9; 10; 20; 50; 100; 500; 1000; >1000

Rehabilitation				
*Baseline rehabilitation state	1. Annual groundcover or cultivation	2. Perennial exotic groundcover	3. Perennial native groundcover	4. Native vegetation remnant
Progress	Not yet undertaken	Satisfactory		Unsatisfactory
Notes on rehabilitation concerns with regard to soil erosion, vegetation cover establishment, landform contouring, contamination.				

* record the original site condition as the goal for future rehabilitation works.

Type A Restricted Plants (flag 1 each across ESU)

Restricted plants	Species	No.	Coordinates					
			Easting	Northing	Easting	Northing	Easting	Northing
Orchidaceae sp. (orchids)								
Xanthorrhoea sp. (Grass trees)								
Myrmecodia sp. (Ant plants)								
Hydnophytum sp. (Ant plants)								
Cycadaceae sp. (Cycads)								
Zamiaceae sp. (Cycads)								
Huperzia sp. (lace plants)								
Platycerium sp. (Staghorns)								
Brachychiton sp. (Bottle trees)								
Livistona sp. (Cabbage palms)								

Threatened Flora (flag 1 each across ESU)

Threatened Flora Species		No.	Coordinates					
			Easting	Northing	Easting	Northing	Easting	Northing

Other points of interest (track/ll restriction locations, additional flora sp.) (flag 1 each across ESU)

Description / notes	Coordinates		Photo number
	Easting	Northing	

Ground cover monitoring (100m transect)

Location	Duntroon Gravel Pit	Survey name	Plot number	Recorders
Date	09/05/12	GP3	3	Leanne Stevens.

Grid Reference	Zone	Datum	Transect Start (0m)	Transect end (100m)
	54 55 (56)	GDA94.	E N	E N

Transect length	100m	Orientation	98°	Marked	Yes (No)	Photo # / orientation	765

Ground cover	Tally (1 per point of contact (0 to) over 2m along 100m transect (200 points))	Total
Litter	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸	
Bare ground	𝍸 𝍸 𝍸 𝍸 𝍸	
Cryptogram	𝍸	
Woody debris	𝍸 𝍸	
Rock		
Exotic – Annual		
Exotic – Perennial		
Shrub (crown height <1m)		
Grass – Hummock*		
Grass – Other*	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸	
Forb*	𝍸 𝍸	
Sedge / Rush*	𝍸 𝍸 𝍸 𝍸	
Fern*	𝍸 𝍸	
Other*	𝍸 𝍸	

* Native species

Diagnostic (woody) flora (100m x 5m transect)

Woody flora species observed	Form	Relative Dominance	Tally			
			T1 layer	T2 layer	S1 layer	Seedlings
Acacia	T			𝍸 𝍸	𝍸	𝍸
Callitris glaucophylla	T		𝍸	𝍸 𝍸	𝍸	𝍸 𝍸
Euc. willisii	T		𝍸 𝍸			
Euc. fibrosa.			𝍸			

Species annotations	S=specimens collected; *=Exotic species; **=Declared species; +=Outside but adjoining plot
Form	T=Tree; S=Shrub; Seed=Seedling; Sap=Sapling
Relative dominance	D=Dominant; A=Abundant; F=Frequent; O=Occasional; R=Rare
Abbreviations	N/A=Not Applicable; N/R=Not Recorded; N/O=None Observed

Fauna Habitat Assessment (within 1-50)

No. of trees/ha with hollows (>10cm)	20	No. of hollow logs/ha	5	Total length of logs/ha (>10cm)	200	No. of logs/ha (>10cm)	10

Habitat feature	Status			
Cliffs / outcrops	(Absent)	Scattered	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	(Scattered)	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Leaf litter	Absent	Scattered	(Common)	Abundant
Dense shrub/grass shelter	Absent	(Scattered)	Common	Abundant
Termite mounds (>50cm)	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	(Absent)	Scattered	Common	Abundant
Seeding grass cover	Absent	(Scattered)	Common	Abundant
Fleshy fruiting plants	(Absent)	Scattered	Common	Abundant
Nectar / pollen	(Absent)	Scattered	Common	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Waterway	(Absent)	Scattered	Common	Abundant
Wetland / Swamp / Waterbody	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	(Common)	Abundant
Mistletoe/Epiphytes	Absent	(Scattered)	Common	Abundant

Fauna Sign (Within 1-50)

Scats/pellets/ food remains	Absent	(Scattered)	Common	Abundant
Animal tracks / trails	Absent	(Scattered)	Common	Abundant
Bones, feathers	(Absent)	Scattered	Common	Abundant
Diggings / burrows	(Absent)	Scattered	Common	Abundant
Shelters / nests	(Absent)	Scattered	Common	Abundant
Tree scratches / feed scars	(Absent)	Scattered	Common	Abundant

Incidental Fauna Sightings and Breeding Places (within 50)

Species Name	Conservation Status	Breeding Place (eg. nests, hollows, logs, peeling bark)	Coordinates		Other Information (eg. Growth stage, number of individuals)
			Eastings	Northings	

Conservation Status

		Special Least Concern Species	Colonial Breeding Species
E	Endangered	Koala, Echidna, Platypus, Migratory Species	"a group of animals of the same kind co existing in close association for breeding purposes"
V	Vulnerable		
NT	Near Threatened		Eg. Frogs, Microbats, Babblers, Apostlebirds, etc.
SLC	Special Least Concern		
CBS	Colonial Breeding Species		
LC	Least Concern		

VCR ✓

ENVIRONMENTAL FIELDWORK SHEET (EFS)

Site identification

Site Name:	Duntyoon Gravel Pit 4	Date:	09/05/2012
Site / Waypoint Number:	4	Assessor/s:	Leanne Stevens

Development type and location

Development type				Location description	
Production Well Site	☐	Gas Processing Facility	☐	Easting	310711.6
Pilot Well + Dam	☐	Dam	☐	Northing	6[illegible]7
Core/Chip Hole	☐	Pipeline	☐	Datum + zone	GDA94, zone 56
Frac well	☐	Seismic Line	☐	Other description	Gravel pit
SIS well	☐	Roads	☐		
Well pad	☐	Other	☒		

Photo numbers and notes

Camera used Leanne's

A		E	
B		F	
C		G	
D		H	

Landform within 300m

Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

Physiography (ESU)

Slope	Level (<1%)	Very gently inclined (>1-3%)	Gently inclined (>3-10%)	Mod. inclined (>10-32%)				
	Steep (32-55%)	Very steep (56-100%)	Precipitous (100-299%)	Cliffed (>300%)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Geology	Alluvial	Clay	Sand	Coarse sedimentary	Fine sedimentary				
	Igneous (coarse)	Volcanic (fine)	Metamorphic	Limestone	Laterite				
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Texture	Clay	Silt	Loam	Sand	Gravel	Saline mud			
Erosion	Absent			Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			
Soil / Erosion notes									

Disturbance (ESU)

Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	Comment:	
Weeds	Absent	Scattered	Frequent	Dominant			
Declared Weeds							
Dieback	0%	1-25%	26-75%	>76%			
Site condition	Very good	Good	Moderate	Poor	Degraded		
Fire scars	Absent	Scattered	Frequent	Time since	Recent	Old	Average Height (m)
Disturbance notes							

Vegetation structure and context (ESU)

Dominant growth form	Closed forest	Open forest	Woodland	Shrubland	Grassland	Forbland	Wetland
Growth stage	Senescent	Uneven age	Mature	Advanced regeneration	Early regeneration		
Ecologically dominant layer (EDL)	T1	T2	S1	S2	G		
Median height (m) of EDL	28m	Median DBH (cm) of canopy species					
% Crown cover	>70%	30-70%	10-30%	<10%			
Mid-storey density	Absent	Sparse	Dense	Very dense			
Remnant status	Remnant	High value regrowth	Non-remnant	Other			
Landscape state	Intact	Variegated	Fragmented	Relictual			
Condition notes							

Preliminary flora assessment (ESU)

	RE Code	EPBC Status	VMA Status	Biodiversity Status
RE as mapped	11.5.1/11.5.20	NC	LC	NOE
Survey result	11.5.1			
Agree w/ mapped RE?	Yes			
If no, provide reasons				

Vegetation for site [illegible] (see attached Vegetation Survey Guide 2010 for method)

Sub-stratum	Growth form	Field name	Species name	Cover	Abundance	Field No.
Seedling			Allocasuarina huhnmanniii	15	50	
S1			Allocasuarina huhnmanniii	5	10	
Seedling			Acacia salicina	<1	1	
T2			Acacia salicina	2	2	
T1			Eucalyptus victrix	5	4	
T2			Eucalyptus victrix	<1	1	
T2			Acacia salicina	<1	1	
			Panicum effusum	10	100	
			Aristida caput-medusae	2	50	
			Aristida calycina	1	20	
			Aristida ramosa	1	20	
			Eragrostis parviflora	20	200	
		Pine-like	Cassinia	<1	2	
			Fimbristylis dichotoma	5	100	
			Tripogon loliiformis	1	200	
			Eragrostis brownii	10	100	
			Vittadinia dissecta	<1	5	
			Lomandra sp.	<1	2	
			Dichanthium sericeum	10	100	

Growth form	T=tree; M=mallee tree; S=shrub; Z=heath shrub; C=chenopod shrub; G=tussock grass; H=hummock grass; D=sod grass; V=vine; R=rush; E=fern; F=forb; A=cycad; P=palm; X=xanthorrhoea; U=samphire shrub, O=other
Cover	Crown cover measured in the following categories <1%; 1%; 2%; 3%; 4%; 5%; 10%; 15%; 20%; 25%; 30%; 35%; 40% etc
Abundance	Number of individuals measured in the following categories 1; 2; 3; 4; 5; 6; 7; 8; 9; 10; 20; 50; 100; 500; 1000; >1000

Rehabilitation

*Baseline rehabilitation state	1. Annual groundcover or cultivation	2. Perennial exotic groundcover	3. Perennial native groundcover	4. Native vegetation remnant
Progress	Not yet undertaken		Satisfactory	Unsatisfactory
Notes on rehabilitation concerns with regard to soil erosion, vegetation cover establishment, landform contouring, contamination.				

* record the original site condition as the goal for future rehabilitation works.

Typical restricted Flora found search across (SU)

Restricted plants	Species	No.	Coordinates					
			Easting	Northing	Easting	Northing	Easting	Northing
Orchidaceae sp. (orchids)								
Xanthorrhoea sp. (Grass trees)								
Myrmecodia sp. (Ant plants)								
Hydnophytum sp. (Ant plants)								
Cycadaceae sp. (Cycads)								
Zamiaceae sp. (Cycads)								
Huperzia sp. (lace plants)								
Platycerium sp. (Staghorns)								
Brachychiton sp. (Bottle trees)								
Livistona sp. (Cabbage palms)								

Threatened Flora (find search across (SU)

Threatened Flora Species		No.	Coordinates					
			Easting	Northing	Easting	Northing	Easting	Northing

Other points of interest (e.g. track/fire/structure/locations, additional flora spp) (across (SU)

Description / notes	Coordinates		Photo number
	Easting	Northing	

Site description (100m transect)

Location		Survey name	Plot number	Recorders
Date				
Grid Reference	Zone: 54 55 (56)	Datum: GDA94	Transect Start (0m): E / N	Transect end (100m): E / N
Transect length: 100m	Orientation: 205°	Marked:	Yes (No)	Photo # / orientation: 966

Ground cover	Tally (1 point recorded every 1m along 100m transect = 100 points)	Total
Litter	IIII IIII IIII I	
Bare ground		
Cryptogram	II	
Woody debris	II	
Rock		
Exotic – Annual		
Exotic – Perennial		
Shrub (crown height <1m)	IIII II	
Grass – Hummock*		
Grass – Other*	IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII	
Forb*	I	
Sedge / Rush*	IIII	
Fern*		
Other*		

* Native species

Ecological integrity – Woody species (100m x 5m belt transect)

Woody flora species observed	Form	Relative Dominance	Tally T1 layer	Tally T2 layer	Tally S1 layer	Tally Seedlings
Euc. calophylla			IIII	II		I
Callitris glaucophylla			IIII	IIII II	IIII III	IIII IIII
Acacia				IIII III	III	II
Allocasuarina huegeliana			I	IIII III	III	IIII IIII IIII IIII

Species annotations	S=specimens collected; *=Exotic species; **=Declared species; +=Outside but adjoining plot
Form	T=Tree; S=Shrub; Seed=Seedling; Sap=Sapling
Relative dominance	D=Dominant; A=Abundant; F=Frequent; O=Occasional; R=Rare
Abbreviations	N/A=Not Applicable; N/R=Not Recorded; N/O=None Observed

No. of trees/ha with hollows (>10cm)	10	No. of hollow logs/ha	5	Total length of logs/ha (>10cm)	100	No. of logs/ha (>10cm)	88

Habitat feature	Status			
Cliffs / outcrops	(Absent)	Scattered	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	(Scattered)	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Leaf litter	Absent	Scattered	(Common)	Abundant
Dense shrub/grass shelter	Absent	(Scattered)	Common	Abundant
Termite mounds (>50cm)	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	(Absent)	Scattered	Common	Abundant
Seeding grass cover	Absent	(Scattered)	Common	Abundant
Fleshy fruiting plants	(Absent)	Scattered	Common	Abundant
Nectar / pollen	(Absent)	Scattered	Common	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Waterway	(Absent)	Scattered	Common	Abundant
Wetland / Swamp / Waterbody	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	(Common)	Abundant
Mistletoe/Epiphytes	Absent	(Scattered)	Common	Abundant

Scats/pellets/ food remains	Absent	(Scattered)	Common	Abundant
Animal tracks / trails	(Absent)	Scattered	Common	Abundant
Bones, feathers	(Absent)	Scattered	Common	Abundant
Diggings / burrows	(Absent)	Scattered	Common	Abundant
Shelters / nests	(Absent)	Scattered	Common	Abundant
Tree scratches / feed scars	(Absent)	Scattered	Common	Abundant

Species Name	Conservation Status	Breeding Place (eg. nests, hollows, logs, peeling bark)	Coordinates		Other Information (eg. Growth stage, number of individuals)
			Eastings	Northings	

Conservation Status

E	Endangered	Special Least Concern Species	Colonial Breeding Species
V	Vulnerable	Koala, Echidna, Platypus, Migratory Species	"a group of animals of the same kind co-existing in close association for breeding purposes"
NT	Near Threatened		
SLC	Special Least Concern		Eg. Frogs, Microbats, Babblers, Apostlebirds, etc.
CBS	Colonial Breeding Species		
LC	Least Concern		

Ecological Field Survey (Brownfield Form 1005)

targetzero

Tetris 1. CAK 1236

SITE IDENTIFICATION			
Site Name:	Adjacent 53 & Landown	**Date:**	5 September 2019
Tenure:	PL1040	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION					
Development Type				**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility			**Easting (E)**	310384
☐ Pilot Well + Dam	☐ Dam			**Northing (N)**	6965740
☐ Monitoring	☐ Pipeline			**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line			**Other description**	
☐ Work over	☐ Property (area) wide				

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 1	Forgot to take photos	#	
East	" 2	"	#	
South	# 3	"	#	
West	# 4	"	#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	('Loamy sand')	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	16		**Avg DBH (cm) of EDL**	10	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S 150°	Start Easting	310388	End Easting	310378
		Start Northing	6965770	End Northing	6965713

Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		10	20	2	10			0.1	2		
Canopy cover (%)											

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Callitris glaucophylla		111		36	75			
Eucalyptus crebra		5		4	1			
Acacia leiocalyx		20		1	13		6	
A. confluens		1			1			
Casuarina inophloia		2			2			
Melaleuca nodosa		1			1			
Entolasia stricta								
Chiloglottis sieberi								
Austrostipa scabra subsp.								
Echinopogon ovatus								

BCP

T2 T1
35 12
20 6
9 10
8 8

NC1

T1 T2
. .
. .

Hop, OA

T2
. .

A. leiocalyx

T2 T1 S1
5 1
5

Pollu NB

T2
.

8m NC2

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	74	75	76	77	78	
Native perennial grass	20		5	10	25	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	70	93	95	80	70	
Rock						
Bare ground	10	5				
Cryptogams		2		10	5	
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4			
Survey result	11.7.4/11.5.1			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	1	Total length of logs (>10cm)	12	No. of logs (>10cm)	3
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Large Nest	Raptor				

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remnt vgtn
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / (No)		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

SW Corn of land is in CZ7

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Tetris ROW 3	**Date:**	09/09/19
Tenure:	PL 1040	**Assessor(s):**	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	007 306547
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6964 392
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 100		#	
East	# 20		#	
South	# 21		#	
West	# 22		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	NW	SE	SW	(Nil)
Soil Colour	White	Yellow	Orange	(Brown)	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	(Absent)	Scattered	Frequent
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	5				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1		S2		G		
Avg height (m) of EDL	1.5					**Avg DBH (cm) of EDL**	–					
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a		
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse		Very sparse		Absent		

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	SE	Start Easting	008 306529		End Easting	009 306572						
		Start Northing	6964 404		End Northing	6964360						
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)	8	10							1	1.75	0.5	1
Canopy cover (%)	1								40		75	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1 (60)	S2 (70)
		TOTALS						
Acacia leucadyx		130						
Cahuia appina								
Acacia (Less hooging branches)	Acacia confusa	20						20
Native fern	Cheilanthes sieberi							
Eucalyptus sp. Crabra		2					1	1
Alphitonia excelsa		1						1
~~Allocasuarina littoralis~~ hairyare	Allocasuarina inophloia	3						3

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #						
Native perennial grass						
Native other grass (if relevant)						
Native forbs and other species (non-grass)				30	5	7
Native shrubs (<1m)					5	1
Non-native grass						
Non-native forbs and shrubs						
Litter	5	15	30	50	80	36
Rock						
Bare ground	95	85	70	20	10	56
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.4	N/A	LC	NCAP
Survey result	Disturbed 11.7.4	N/A	"	"
Agree with mapped RE? If no, provide justification from field data	Rocky soil, Land zone 7, E. crebra scattered emergents, no E. shirocloda.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	6	No. of logs (>10cm)	1
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	120	Per hectare (x 20)	20

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Scattered trees 7Lm
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment:	Yes / (No)		Is the vegetation suitable for slashing only?
	Yes / No		Is the slope < 5%?
Suitable – if all 4 questions are yes	Yes / No		Is the clay content > 20%?
	Yes / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

target zero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	NE ROW - Tetris	**Date:**	09/08/19
Tenure:	PL1040	**Assessor(s):**	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	310134
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965 495
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: (55) or 56
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 3		#	
East	# ↓		#	
South	# ↓		#	
West	# 6		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)			
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)			
Aspect	N	S	E	W	NE	NW	SE	(SW)	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	('Silty loam')			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion		(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	(Forestry)	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	(Logging)	Thinning	No disturbance						
Dieback	0%	(1-25%)	26-75%	>76%	n/a							
Site condition	Very good	(Good)	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	(Frequent)	**Time since**	Recent	(Old)	**Average Height (m)**	1.5				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2		S1			S2			G
Avg height (m) of EDL	13					**Avg DBH (cm) of EDL**			40			
Canopy cover (%) of EDL	>70% (dense/closed)			(30-70% (mid-dense))		10-30% (sparse)			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			(Very sparse)			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SE	Start Easting	~~001~~ 310123	End Easting	310152
		Start Northing	~~6965~~ 6965514	End Northing	6965484

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		13 | 15	10 | 12	6 | 8	0.5 | 15	
Canopy cover (%)		20	40	10	10	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus globoidea		~~1~~23		11 (2)	~~IIII~~ IIII (9)	IIII (4)	~~IIII~~ II (7)	~~I~~ 1 (1)
Callitris glaucophylla		12			III (3)	~~IIII~~ I (9)	I	
Senna leaves	Senna artemisioides	10					~~IIII~~ IIII (10)	
Bursaria spinosa		3					III (3)	
Unknown - young canopy (sample)	Melaleuca uncinata	1					I (1)	
Dodonaea sp (sample)	Dodonaea heteromorpha							
Acacia leptalyne		1				I (1)		
rigid shrub, wide leaves	Eucalyptus microtheca	1					I (1)	
Wide-leaved saltbush	Einadia nutans							
Aristida ramosa								
Gahnia aspera								
Sedge	Cyperus gracilis							
White spargoss	Aristida leptopoda							
Aristida caput-medusae								
Dianella caerulea								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	1	2	7	8	9	
Native perennial grass						
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)	2					0·4
Non-native grass						
Non-native forbs and shrubs		5	10	15		6
Litter	85	75	75	75	95	81
Rock						
Bare ground	13	20	15	10	5	12·6
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.4	N/A	LC	NCAP
Survey result	11.7.4	N/A	LC	NCAP
Agree with mapped RE? If no, provide justification from field data	No, ~~grevilea~~ land zone 7, dominated by E. fibrosa not E. chlorocladia			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	1 (1)	No. of hollow logs	1 (1)	Total length of logs (>10cm)	THL THL THL (15)	No. of logs (>10cm)	IIII (4)
Per hectare (x 20)	20	Per hectare (x 20)	20	Per hectare (x 20)	300	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Trees 7 4m
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No)		Is the vegetation suitable for slashing only?
	Yes / No		Is the slope < 5%?
	Yes / No		Is the clay content > 20%?
	Yes / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

ogical Field Survey

targetzero

SITE IDENTIFICATION			
Site Name:	Halliford S4 ROW N Tetris ROW Northern 2	Date:	09/09/19
Tenure:	PL1040	Assessor(s):	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	004 309801
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6965529
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 10		#	
East	# 11		#	
South	# 12		#	
West	# 13		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	(Nil)
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%		26-75%	>76%	n/a	
Site condition	Very good	Good		Moderate	Poor	Degraded	
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)** 2
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2			G
Avg height (m) of EDL	16					**Avg DBH (cm) of EDL**			30			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	N	Start Easting	005 309796	End Easting	309812		
		Start Northing	6965505	End Northing	6965554		
Stratum	E	T1	T2	T3	S1	S2/Seedlings	
Height range (m)		15 | 18	8 | 10	4 6 | 8 6	1.5 | 2	005 | 018	
Canopy cover (%)							

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus woodsiana		10		III (3)	II (2)	III (3)	I (1)	I (1)
Eremophila mitchellii		18				IIII (5)	IIII (5)	IIII IIII (8)
Allocasuarina huegeliana		11				IIII (4)	III (3)	IIII (4)
Cratystylis conocephala								
Sedge	Cyperus gracilis							
Wide-leaf saltbush	Einadia nutans							
Aristida ramosa								
Aristida capito-meduseae								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	14	15	16	17	18	
Native perennial grass	5	5	5	2		3.4
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	45	95	95	98	100	86.6
Rock						
Bare ground	50					10
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.4	N/A	LC	NCAP
Survey result	11.5.20	"	"	"
Agree with mapped RE? If **no**, provide justification from field data	NO, canopy dominated by E. woolsiana, not E. chlorocalyx			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	**No. of hollow logs**	12	**Total length of logs (>10cm)**	16	**No. of logs (>10cm)**	12
Per hectare (x 20)	0	**Per hectare (x 20)**	40	**Per hectare (x 20)**	320	**Per hectare (x 20)**	40

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	Yes	No	Trees >4m
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes	No	Is the vegetation suitable for slashing only?
	Yes	No	Is the slope < 5%?
	Yes	No	Is the clay content > 20%?
	Yes	No	Are gilgais absent?
Suitable for minimal disturbance?	Yes	No	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Halliford 59	**Date:**	10/09/19
Tenure:	PL1640	**Assessor(s):**	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	307160
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965461
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 57		#	
East	# 58		#	
South	# 59		#	
West	# 60		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	(Nil)
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	~~Absent~~		(Scattered)	Frequent				
Erosion Type	(Tunnelling)	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	\				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	16					**Avg DBH (cm) of EDL**			35			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	307155	End Easting	
		Start Northing	6965484	End Northing	

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		15 | 18	8 | 10		1 | 2	0.3 | 0.7
Canopy cover (%)		10	20		5	1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Alphitonia excelsa		4			II (2)			II (2)
Acacia leiocalyx		51					(17) IIII IIII IIII IIII IIII (15)	IIII IIII IIII IIII (19)
Coltris glaucophylla		19		III (3)	IIII IIII IIII (16)			
Acacia conferta		9						IIII IIII (9)
Eucalyptus crebra		6		III (3)			I (1)	II (2)
Allocasuarina luehmannii		2			II (2)			
Melaleuca decora		18					IIII II (12)	IIII I (6)
Petalostigma pubescens		1						I (1)
Diapella sp.								
Cheilanthes sieberi (dry)								
Aristida caput-medusae								
Cajanus aspera								
Sida sp. (dry)								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	61	62	63	64	65	
Native perennial grass						
Native other grass (if relevant)						
Native forbs and other species (non-grass)	20	~~20~~ 5	15	10		10
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	75	95	80	70	100	84
Rock						
Bare ground	5		5	20		6
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.4	N/A	LC	NCAP
Survey result	11.5.1	N/A	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	No, canopy dominated by E. crebra, not E. chloroclada			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	1 (1)	Total length of logs (>10cm)	~~IIII~~ (18)	No. of logs (>10cm)	IIII (4)
Per hectare (x 20)	0	Per hectare (x 20)	20	Per hectare (x 20)	360	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	Yes	No	Remnant veg 7Ha
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No Yes / No Yes / No Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Audit Survey

targetzero

► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Halliford 60	**Date:**	10/09/19
Tenure:	PL1040	**Assessor(s):**	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	306505
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965 657
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 48		#	
East	# 49		#	
South	# 50		#	
West	# 51		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	(W)	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	3.5
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	8					**Avg DBH (cm) of EDL**			15			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	WNW	Start Easting	306533	End Easting	
		Start Northing	6965854	End Northing	

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)	10 | 12	7 | 10	3 | 6		1 | 2	0.5 | 1
Canopy cover (%)	2	10	20		10	25

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus chloroclada		17			III (3)		II (2)	~~IIII~~ ~~IIII~~ II (12)
Eucalyptus cebra		20			I (1)		I (1)	~~IIII~~ ~~IIII~~ III (13)
Acacia pycnantha Acacia pycnantha		~~III~~ II					III (4)	~~IIII~~ II (7)
Petalostigma pubescens		18						~~IIII~~ ~~IIII~~ IIII (18)
Gahnia aspera					~~I~~		~~I~~	
Aristida caput-medusae								
Acacia leiocalyx		20			~~IIII~~ ~~IIII~~ I (11)		~~IIII~~ I (6)	III (3)
Hairy oak Allocasuarina inophloia		9		II (2)			III (3)	IIII (4)
Acacia conferta		5						~~IIII~~ (5)
Alphitonia excelsa		1					I (1)	
Aristida ramosa								
Unknown forb-burnt								
Woolly lomandra Lomandra leucocephala								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #						
Native perennial grass						
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	5	30			9
Native shrubs (<1m)	20	10		20	75	25
Non-native grass						
Non-native forbs and shrubs						
Litter	15	80	20	40	15	34
Rock						
Bare ground	55	5	50	40	10	32
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.4	N/A	LC	NCAP
Survey result	" "	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	12	No. of logs (>10cm)	5
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	240	Per hectare (x 20)	100

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

targetzero
► zero incidents ► zero injuries

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	**Likely Species/Group**	**Conservation Status (see below)**	**Coordinates (GDA94)**		**Other Information (e.g. age, collected, active/inactive)**
			Easting	**Northing**	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Trees 74m
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No)		Is the vegetation suitable for slashing only?
	Yes / No		Is the slope < 5%?
	Yes / No		Is the clay content > 20%?
	Yes / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

targetzero
► zero incidents ► zero injuries

LAR 1238 Tetris

SITE IDENTIFICATION			
Site Name:	Halliard 5H	**Date:**	16 September 2019
Tenure:	PL 1040	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	309 701
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965 219
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 100		# 104	
East	# 101		# 106	
South	# 102		#	
West	# 103		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)		Moderately sloping (5-10%)		Strongly sloping (11-24%)		
	Moderately steep (25-38%)	Steep (39-55%)		Very steep (56-100%)		Slope >100% (45°)		
Aspect	N	S	E	W	NE	NW	SE	SW	NiP
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)		Scattered		Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	(Forestry)	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	(Logging)	Thinning	No disturbance						
Dieback	0%	1-25%	(26-75%)	>76%	n/a							
Site condition	Very good	(Good)	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	(Frequent)	**Time since**	(Recent)	Old	**Average Height (m)**	6 m				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	18 m		**Avg DBH (cm) of EDL**	20 cm	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	(10-30% (sparse))	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia stricta	Low				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey ORG-ARW-HSM-FOR-00067 targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	N.360 ~~S 180°~~	**Start Easting**	309690		**End Easting**	309703		
		Start Northing	6965191		**End Northing**	6965231		
Stratum	**E**	**T1**	**T2**		**T3**	**S1**	**S2/Seedlings**	
Height range (m)		10 | 23	2 | 10			1 | 2	0.1 | 1	
Canopy cover (%)		30	15			<5%	<1%	

Common name/collection name	Species name	Sample (Field No.)	E	T1	T2	T3	S1	S2
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						
Eucalyptus woollsiana		2		2				
E. crebra	E. crebra	12		6	4		2	
Callitris glaucophylla		2		1	1			
Acacia leiocarpa		3						3
A. murrayana		5					4	1
Gahnia aspera								
Aristida caput medusae	Aristida caput medusae							

PBY
S1

NZ1
T1
T2

NR
S1

A linear
S2

BCB
T1
T2

Acm ?
S1

S2

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	104	105	106	107	108	
Native perennial grass	5		2	2		
Native other grass (if relevant)		10	10	15	10	
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	70	70	65	65	55	
Rock						
Bare ground	25	20	23	18	35	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	C NA	LC	NOC
Survey result	11.5.1	NA	LC	NOC
Agree with mapped RE? If no, provide justification from field data	No. 11.7.4 mapped by 3D Ecosmart. Close to mapping boundary of 11.5.1 / 11.7.4			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	6	No. of hollow logs	1	Total length of logs (>10cm)	9	No. of logs (>10cm)	4
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	**Likely Species/Group**	**Conservation Status (see below)**	**Coordinates (GDA94)**		**Other Information (e.g. age, collected, active/inactive)**
			Easting	**Northing**	
Large trees					
Log					
Dead Stags					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		**If required, why?**
Fauna spotter/catcher	(Yes)	No	Remnant veg
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

LAR 1236 Tetra

SITE IDENTIFICATION			
Site Name:	Helifield 62	Date:	16 September 2019
Tenure:	PL 1040	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION					
Development Type				Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility			Easting (E)	309991
☐ Pilot Well + Dam	☐ Dam			Northing (N)	6964027
☐ Monitoring	☐ Pipeline			Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line			Other description	
☐ Work over	☐ Property (area) wide				

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 118		#	
East	# 119		#	
South	# 120		#	
West	# 121		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	(Absent)	Scattered	Frequent													
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank										

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	12m				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	17		**Avg DBH (cm) of EDL**	20	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

12 24 15M
3+4 4

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	E 270	Start Easting	310017	End Easting	309977
		Start Northing	6964016	End Northing	6964033

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		12 | 24	2 | 12		1 | 2	0.1 | 1
Canopy cover (%)		30	10		2	1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus cvebara		23		5	1			17
Callitris glaucophylla		4		2	2			
Acacia leiocalyx		4			2		2	
A. ramulosa		13					5	8
Allocasuarina luehmannii		1						1
Gahnia aspera								
Solanum esuvicle								
Chiladtes sieberi	Chiladtes	sieberi v sieberi						

NR1
T1 T2
Sc 17
BCP
T1 T2
A. leiocalyx
T2 S1 8
Acacia
S1
Dodonaea
S1 Sc
8
B.O Sc

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	122	123	124	125	126	
Native perennial grass						
Native other grass (if relevant)			10			
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	50	~~70~~ 75	50	65	100	
Rock						
Bare ground	50	23	40	30		
Cryptogams		2		5		
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	NA	LC	Not
Survey result	11.5.1	NA	LC	Not
Agree with mapped RE? If no, provide justification from field data	No Field verified by 3D Ecosmart close to bounds of RE 11.5.1			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	12	Total length of logs (>10cm)	17	No. of logs (>10cm)	28
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for nectar / pollen	Absent	Scattered	(Common)	Abundant
Potential for fleshy fruiting plants	(Absent)	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	(Scattered)	Common	Abundant
Dense shrub/grass shelter	(Absent)	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	(Common)	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	(Scattered)	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	(Scattered)	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	(Scattered)	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	(Common)	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	(Common)	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	(Common)	Abundant
Mistletoe/Epiphytes	Absent	Scattered	(Common)	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remnant vegetat
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No (Yes) / No (Yes) / (No)		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Kombaillo SF

Koala Survey Datasheet Refuj

Site: H62 ROW	Date: 16.9.2019	Lat: 309327	Long: 696477
Vegetation community description: M.S-1			

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. Eucalyptus crebra	27%
2. Call. tris glaucophylla	3%
3.	
4.	
5.	
6.	
Total Canopy Cover:	30%
Vegetation ground cover (% of the ground area):	6%
Leaf litter cover (% of the ground area):	50
Bare ground cover (% of the ground area):	44%
Area of surface water (% of the ground area):	0%
Distance (m) to surface water:	?
Evidence of dogs in the area?	Few dogs observed
Evidence of scratches/scats (type and age)?	No

Spot Assessment Technique (Phillips & Callaghan 2011).

Number of trees with Koala scats beneath (within 1m of tree base)	0
Total number of trees surveyed	40
Proportion of trees with Koala scats beneath	0

Were any Koalas observed? If so, record where possible...

Koala's sex:	
Koala's disease status:	
Koala's reproductive status:	
Tree species:	
Tree height:	
Tree DBH:	

Photograph log.

Photo number	**Description**

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero

LAR1231 Tetrii

SITE IDENTIFICATION			
Site Name:	Hellford 70	Date:	17 September 2019
Tenure:	PL 1040	Assessor(s):	Peter Dall

DEVELOPMENT TYPE & LOCATION					
Development Type				Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility			Easting (E)	305773
☐ Pilot Well + Dam	☐ Dam			Northing (N)	6965650
☐ Monitoring	☐ Pipeline			Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line			Other description	
☐ Work over	☐ Property (area) wide				

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 162		#	
East	# 163		#	
South	# 164		#	
West	# 165		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	(Loamy sand')	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)		(Forestry)		Cropping		Conservation		Mining		Other:	
Evidence	Clearing		Cultivation		Regrowth		(Logging)		Thinning		No disturbance	
Dieback	0%		1-25%				(26-75%)		>76%			n/a
Site condition	Very good		Good				(Moderate)		Poor			Degraded
Fire scars	Absent	Scattered	(Frequent)	**Time since**		(Recent)		Old	**Average Height (m)**		10m	
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2			S1			S2		G
Avg height (m) of EDL	~~REP~~ 16m						**Avg DBH (cm) of EDL**			20		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			(10-30% (sparse))			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			(Sparse)			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia stricta	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S 180°	Start Easting	305774	End Easting	305774
		Start Northing	6965687	End Northing	6965627

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		10 / 18	2 / 10		1 / 2	0.1 / 1
Canopy cover (%)		20	15		10	1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia leiocarpa		27					15	12
Callitris glaucophylla		10		2	8			
Allocasuarina inophloia		2			2			
Lysicarpus angustifolius		1		1				
Eucalyptus ebrina		3		3				
Allocasuarina luehmanii		~~5~~ 4					1	~~4~~ 4
							1	~~4~~
Lomandra patens								
Bahinia aspera								
Calotis hispidula								
Aristida caput-medusae								
Chrysolbis siebeni x siebeni								

1x2.5 1+4 1+2
1+3

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	166	167	168	169	170	
Native perennial grass	15			5		
Native other grass (if relevant)		10	5			
Native forbs and other species (non-grass)						
Native shrubs (<1m)					10	
Non-native grass						
Non-native forbs and shrubs						
Litter	45	45	45	30	4	
Rock						
Bare ground	35	45	50	65	86	
Cryptogams	5					
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	Nr	LC	NOC
Survey result	11.5.1	11	11	11
Agree with mapped RE? If no, provide justification from field data	May No. Mapped by 3D Ecosmart indeterminate if LZ is 5 or 7.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	1	Total length of logs (>10cm)	12.5	No. of logs (>10cm)	6
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

targetzero
► zero incidents ► zero injuries

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	**Likely Species/Group**	**Conservation Status (see below)**	**Coordinates (GDA94)**	**Other Information (e.g. age, collected, active/inactive)**
			Easting / **Northing**	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Remote Log
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

targetzero ► zero incidents ► zero injuries

LAR 1236 Tetris

SITE IDENTIFICATION			
Site Name:	Halifond 61	Date:	17 September 2009
Tenure:	PL 1040	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	309208
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6964475
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 127		#	
East	# 128		#	
South	# 129		#	
West	# 130		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	(Grazing)	(Forestry)	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	(Logging)	Thinning	No disturbance		
Dieback	0%	1-25%		(26-75%)	>76%		n/a	
Site condition	Very good	Good		(Moderate)	Poor		Degraded	
Fire scars	Absent	Scattered	(Frequent)	**Time since**	(Recent)	Old	**Average Height (m)**	8m
Disturbance notes	Severe fire has burnt some of the area 22							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			(T2)		S1			S2		G	
Avg height (m) of EDL				14		**Avg DBH (cm) of EDL**			15			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		(10-30% (sparse))			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	369209	End Easting	369198
		Start Northing	6964501	End Northing	6644455

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		10 / 19	2 / 10		1 / 2	0.1 / 2
Canopy cover (%)		20	30		10	2

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Callitris glaucophylla		4		4				
Lysicarpus angustifolius		4						4
Acacia spp 2	Acacia murrayana	15					4	11
Eucalyptus cullen		1					1	
Allocasuarina luehmannii		31			22		7	2
E. woollsiana		1		1				
Baeckea aspera								
Aristida contorta								
Lomandra patens								
Chelaltos sieberi	Chelanthes	sieberi – sieberi						

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	130	131	132	133	134	
Native perennial grass	15	5	30		5	
Native other grass (if relevant)				5		
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	35	70	10	95	35	
Rock						
Bare ground	45	25	40		60	
Cryptogams	10					
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1	Ne	LC	Not
Survey result	11.5.1	Ne	LC	Not
Agree with mapped RE? If no, provide justification from field data	Yes. Fld verified by 3D Ecosurv.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	1	No. of hollow logs	1	Total length of logs (>10cm)	14	No. of logs (>10cm)	3
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Remit us
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes /(No) (Yes) /(No) Yes /(No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORD ARRUM FIELD NOTE

targetzero

LAR 1236 Tetri

SITE IDENTIFICATION			
Site Name:	Hollow 75	**Date:**	17. September 2019
Tenure:	PL 1040	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	304962
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965619
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 171		#	
East	# 172		#	
South	# 173		#	
West	# 174		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgal, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	(Logging)	Thinning	No disturbance		
Dieback	0%	1-25%	(26-75%)	>76%	n/a			
Site condition	Very good	Good	Moderate	(Poor)	Degraded			
Fire scars	Absent	Scattered	(Frequent)	**Time since**	(Recent)	Old	**Average Height (m)**	15m
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	(T1)	T2	S1	S2	G
Avg height (m) of EDL	15		**Avg DBH (cm) of EDL**	24	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	(<10% (very sparse))	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	(Sparse)	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	W 270°	Start Easting	304985	End Easting	304936
		Start Northing	6965617	End Northing	6965624

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		10 / 16	2 / 10		1 / 2	0.1 / 1
Canopy cover (%)		8			5	1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina luehmanii		33		1			14	18
Melaleuca nodosa		1					1	
Eucalyptus tibrosa		5		2			2	1
E. crebra		12					1	11
Corymbia clarksoniana		1						1
Lomandra pectens								
Thryptomene (white pea)	Micrbelia punctata							
Aristida sp								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – **Denote plot type employed**					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	175	176	177	178	179	
Native perennial grass						
Native other grass (if relevant)		5		5		
Native forbs and other species (non-grass)						
Native shrubs (<1m)			40		25	
Non-native grass						
Non-native forbs and shrubs						
Litter	10	10	30	15	5	
Rock						
Bare ground	90	85	30	80	70	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.4	NA	LC	Not
Survey result	11.5.4	NA	LC	Not
Agree with mapped RE? If no, provide justification from field data	Yes. Field verified by 3D Ecosmart			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Rmt vegetation
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARV-FRM-[illegible]

targetzero

LAR 1036 Total

SITE IDENTIFICATION			
Site Name:	Halifax 56	**Date:**	17 September 2019
Tenure:	PL 1040	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	308734
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6865075
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 153		#	
East	# 154		#	
South	# 155		#	
West	# 156		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	('Sandy loam')	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	Absent		Scattered		Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	(Forestry)	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	(Logging)	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	(>76%)	n/a							
Site condition	Very good	Good	Moderate	(Poor)	Degraded							
Fire scars	Absent	Scattered	(Frequent)	**Time since**	(Recent)	Old	**Average Height (m)**	10m				
Disturbance notes	Subject to small wildfire											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**(SHR)**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2			(S1)		S2			G
Avg height (m) of EDL							**Avg DBH (cm) of EDL**		/ cm			
Canopy cover (%) of EDL	>70% (dense/closed)			(30-70% (mid-dense))			10-30% (sparse)		<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse		Very sparse			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	W		Start Easting	308 7-9			End Easting	308 707				
			Start Northing	6965671			End Northing	6965080				
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)	10	18							1	4	0.1	1
Canopy cover (%)	±10%								32%		5%	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia cyclops		78					61	18
A. longifolia		6					5	1
Allocasuarina paraphloia	Allocasuarina paraphloia	5					5	
Eucalyptus tereticornis		2	2					
Acacia sp. 2	Acacia murrayana	2					2	
Melaleuca glaucophylla		1	1					
Cassinia carpii angustifolia		6					2	4
Chiloglottis sicheri x sieberi								
Entolasia stricta								
~~Gahnia sieberi~~	Gahnia aspera							
Lomandra patens								

Qa

S1 E

Ecological Field Survey ORG ARW HSM FOR 00067

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

targetzero
► zero incidents ► zero injuries

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	157	158	159	160	161	
Native perennial grass	10			10		
Native other grass (if relevant)						
Native forbs and other species (non-grass)			10			
Native shrubs (<1m)					25	
Non-native grass						
Non-native forbs and shrubs						
Litter	50	25	15	75	25	
Rock						
Bare ground	30	70	75	10	50	
Cryptogams	10	5		15		
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	NA	LC	Not
Survey result	11.7.4	"	"	"
Agree with mapped RE? If no, provide justification from field data	Yes FSEV vegetation mapping by 3D Ecosmart.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	10	No. of logs (>10cm)	6
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

targetzero
► zero rodents ► zero flies

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remnant veg, logs
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / ~~No~~ Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

LAR 1236 Tetrid

SITE IDENTIFICATION			
Site Name:	Halibut 63	**Date:**	17 September 2019
Tenure:	PL104	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION					
Development Type				**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility			**Easting (E)**	309231
☐ Pilot Well + Dam	☐ Dam			**Northing (N)**	6963773
☐ Monitoring	☐ Pipeline			**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line			**Other description**	
☐ Work over	☐ Property (area) wide				

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 138		#	
East	# 137		#	
South	# 138		#	
West	# 139		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	(Pale)	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	(>76%)	n/a							
Site condition	Very good	Good	Moderate	(Poor)	Degraded							
Fire scars	Absent	Scattered	(Frequent)	**Time since**	(Recent)	Old	**Average Height (m)**	1.5m				
Disturbance notes	Several attempted logging < 1 yr > 3 years ago											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**(SHR)**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2			(S1)			S2		G
Avg height (m) of EDL				~~1.2~~ 1.2 m			**Avg DBH (cm) of EDL**			10 cm		
Canopy cover (%) of EDL	>70% (dense/closed)			(30-70% (mid-dense))			10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			(Mid-dense)			Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	E 90°	Start Easting	309214	End Easting	309261
		Start Northing	6963780	End Northing	6963766

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)					1 – 3	0.1 – 1
Canopy cover (%)					40%	2%

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia cordata		46					24	22
A. leiocalyx		10					~~8~~ 7	3
A. spec. Acacia murrayana		~~12~~ 2					~~7~~ 2	~~2~~
Eucalyptus chlorocalyx		5					5	
E. cordata		4					4	
Lomandra pater	Lomandra patens							
Dianella sp.								
Chiliotes sieberi	Chiloanthes sieberi v sieberi							
Eriochloa stuifa								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	140	146	142	143	144	
Native perennial grass						
Native other grass (if relevant)					8	
Native forbs and other species (non-grass)						
Native shrubs (<1m)	30			10	2	
Non-native grass						
Non-native forbs and shrubs						
Litter		20	30		80	
Rock				20		
Bare ground	70	80	70	70	10	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	NA	LC	NOC.
Survey result	11.5.1	NA	LC	NOC
Agree with mapped RE? If no, provide justification from field data	No looks more like LZ 5 than LZ 7. mapped by 3D Reconst. Former RE destroyed by fire.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	26	No. of logs (>10cm)	4
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for nectar / pollen	(Absent)	Scattered	Common	Abundant
Potential for fleshy fruiting plants	(Absent)	Scattered	Common	Abundant
Potential for seeding grass cover	(Absent)	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	(Abundant)
Large Eucalypts (>30cm DBH)	Absent	(Scattered)	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	(Absent)	Scattered	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	(Common)	Abundant
Leaf litter depth	(Absent)	Single layer	Multiple layers	Deep layers
Leaf litter coverage	(Absent)	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	(Scattered)	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	(Common)	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	(Absent)	(Scattered)	Common	Abundant
Mistletoe/Epiphytes	(Absent)	Scattered	Common	Abundant

targetzero
► zero incidents ► zero injuries

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	**Likely Species/Group**	**Conservation Status (see below)**	**Coordinates (GDA94)**		**Other Information (e.g. age, collected, active/inactive)**
			Easting	**Northing**	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

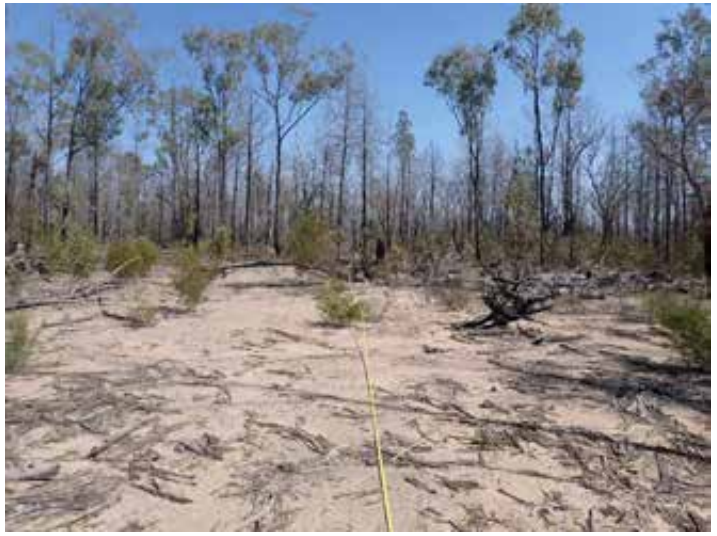
Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	~~(No)~~	Tirlan pole. Scattered litter
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect



West face of the transect

Ecological Field Survey

targetzero
► zero incidents ► zero injuries

LAR 1236 Totris

SITE IDENTIFICATION			
Site Name:	ROW N of Hollow 67	Date:	19 September 2019
Tenure:	PL 1060	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	307541
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6964158
☐ Monitoring	☒ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 189		#	
East	# 190		#	
South	# 191		#	
West	# 192		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	(NW)	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	('Sandy loam')	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	(Absent)	Scattered	Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank										

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)		Forestry		Cropping		Conservation		Mining		Other:	
Evidence	Clearing		Cultivation		Regrowth		Logging		Thinning		No disturbance	
Dieback	0%		1-25%			(26-75%)			>76%			n/a
Site condition	Very good			(Good)			Moderate		Poor			Degraded
Fire scars	Absent	(Scattered)		Frequent	**Time since**		Recent	(Old)		**Average Height (m)**	2m	
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)		(T1)			T2			S1			S2	G
Avg height (m) of EDL		16m					**Avg DBH (cm) of EDL**			24		
Canopy cover (%) of EDL		>70% (dense/closed)			30-70% (mid-dense)			(10-30% (sparse))			<10% (very sparse)	n/a
Functional shrub layer density (<2m)		Dense/closed			Mid-dense			(Sparse)			Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	~~160~~ S	Start Easting	307547			End Easting	307 ~~566~~				
		Start Northing	6964173			End Northing	6964131				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		10	20	3	10			1	3	0.1	1
Canopy cover (%)		20						~~25~~ 15		2	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia leiocarpa		47					39	8
A. conferta		1						1
Albizia versicolor ~~Pinophloia~~		31		3	28			
Petalostigma pubescens		2			2			
Callitris glaucophylla		3		2	1			
Logicarpus angustifolius		3		1	1			1
Alphitonia excelsa		18			3			15
Eucalyptus crebra		2		1			1	
Cahnia ~~sieberi~~ aspera								
Aristida sp.								
Chrysothamnus scabrus v scabrus								
Solanum cleistogamum								

A. Cof. S2

Acac Leu
S1 S2
5 6.2
1

4 0
T2 T1
2 9 20
Quer

Te

BCP
T2 T1

Acac
T2 S2
T1

PKL
T1 S1

PCP S1
T2 15
3

Ecological Field Survey ORG-ARW-HSM-FOR 00067

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

targetzero
► zero incidents ► zero injuries

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	193	194	195	196	197	
Native perennial grass				10		
Native other grass (if relevant)		35				
Native forbs and other species (non-grass)			10			
Native shrubs (<1m)	10				5	
Non-native grass						
Non-native forbs and shrubs						
Litter	60	60	45	55	70	
Rock						
Bare ground	10	5	45	35	25	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1	NA	LC	NOC
Survey result	11.5.1	NA	LC	NOC
Agree with mapped RE? If no, provide justification from field data	Yes. Field verified by 3D Ecosmart.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	8.5	No. of logs (>10cm)	3
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	~~No~~	Remnt vegetation
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

targetzero

GAR1236 Tetris

SITE IDENTIFICATION			
Site Name:	Halifax 77	Date:	18 September 2019
Tenure:	PL 1040	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION					
Development Type				Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility			Easting (E)	304556
☐ Pilot Well + Dam	☐ Dam			Northing (N)	6964205
☐ Monitoring	☐ Pipeline			Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line			Other description	
☐ Work over	☐ Property (area) wide				

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 202		#	
East	# 203		#	
South	# 204		#	
West	# 205		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	(W)	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	(Pale)	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	(Sand)	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)		(Forestry)		Cropping		Conservation		Mining		Other:	
Evidence	Clearing		Cultivation		Regrowth		Logging		Thinning		No disturbance	
Dieback	0%		1-25%				(26-75%)		>76%			n/a
Site condition	Very good		Good				Moderate		(Poor)			Degraded
Fire scars	Absent	Scattered	(Frequent)		**Time since**		(Recent)	Old			**Average Height (m)**	9 m
Disturbance notes	Subject to a severe fire Dec 2016											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	~~T1~~		T1		T2		~~S1~~		S2			G
Avg height (m) of EDL	15						**Avg DBH (cm) of EDL**		30			
Canopy cover (%) of EDL	>70% (dense/closed)				30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed				(Mid-dense)		Sparse		Very sparse			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	W-270°		Start Easting		304582		End Easting		304531				
			Start Northing		6964202		End Northing		6964207				
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)	~~10~~	~~15~~	10	15					1	4	0.1	1	
Canopy cover (%)			6						35		5		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
myrtlesp		24					2x	
Acacia leiocarpa		6					6	
A. murrayana		1					1	
Allocasuarina inophloia		7					7	
Angophora leiocarpa		3		1			2	
Eucalyptus fibrosa		4					2	2
E. cneboa		15					9	6
Lysicarpus angustifolius								
Solanum ~~cunile~~ cuneiale								
Ptilotus macrocephalus								
Lomandra patens								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	206	207	208	209	210	
Native perennial grass	5				5	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	20					
Native shrubs (<1m)	25			10		
Non-native grass						
Non-native forbs and shrubs						
Litter	30	4	12	40	5	
Rock						
Bare ground	20	96	68	5	90	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	~~[illegible]~~ NA	~~[illegible]~~ LC	Not
Survey result	11.5.1	NL	LC	Not
Agree with mapped RE? If no, provide justification from field data	No. Soil to sandy for 11.5.1. Mapped by 3D assmnt.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	1	No. of hollow logs	0	Total length of logs (>10cm)	3m	No. of logs (>10cm)	2
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	**Scattered**	Common	Abundant
Potential for **fleshy fruiting plants**	**Absent**	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	**Common**	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	**Abundant**
Large Eucalypts (>30cm DBH)	Absent	**Scattered**	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	**Absent**	Scattered	Common	Abundant
Small rocks (10-30cm)	**Absent**	Scattered	Common	Abundant
Leaf litter depth	**Absent**	Single layer	Multiple layers	Deep layers
Leaf litter coverage	**Absent**	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	**Scattered**	Common	Abundant
Rock piles	**Absent**	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	**Common**	Abundant
Soil cracks	**Absent**	Scattered	Common	Abundant
Koala feed trees	Absent	**Scattered**	Common	Abundant
Mistletoe/Epiphytes	**Absent**	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
	Hollow trees				
	Logs				

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remnant vegetation
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-0001

targetzero — zero incidents ▶ zero injuries

LAR 1236 Tetris

SITE IDENTIFICATION			
Site Name:	Halifax 74	Date:	18 September 2019
Tenure:	PL 1040	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	Easting (E)	305 352
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6964 257
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 215		#	
East	# 212		#	
South	# 213		#	
West	# 214		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	(Pale)	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2			S1			S2		G
Avg height (m) of EDL							**Avg DBH (cm) of EDL**					
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)							
Transect Start compass bearing	E	Start Easting	305325	End Easting	305375		
		Start Northing	6964292	End Northing	6964280		
Stratum	E	T1	T2	T3	S1	S2/Seedlings	
Height range (m)					1 | 4	0.1 | 1	
Canopy cover (%)					50%	5%	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia cowleana		81					4	77
A. leiocalyx		10					8	2
Eucalyptus crebra		17					16	1
Specimen 1 Teucrium racemosum								
Entolasia stricta								
Embrica aspera								
Specimen 2	Mirbelia pungens							

A. cowleana
S1 S2
4 37
10 30
NIL
S1 S2
12 3
1
A. leiocalyx
S1 S2
2 S1 1+1
S1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	215	216	217	218	219	
Native perennial grass	15		5	10		
Native other grass (if relevant)				10		
Native forbs and other species (non-grass)						
Native shrubs (<1m)	15				20	
Non-native grass						
Non-native forbs and shrubs						
Litter	5	2	5	55	10	
Rock		7				
Bare ground	65	71	90	25	70	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	~~Not~~ NA	LC	NOC
Survey result	11.7.4			
Agree with mapped RE? If no, provide justification from field data	Yes Mapped by 3D Ecosmart			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	1.5	No. of logs (>10cm)	1
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for nectar / pollen	(Absent)	Scattered	Common	Abundant
Potential for fleshy fruiting plants	(Absent)	Scattered	Common	Abundant
Potential for seeding grass cover	(Absent)	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	(Abundant)
Large Eucalypts (>30cm DBH)	(Absent)	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	(Absent)	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	(Common)	Abundant
Small rocks (10-30cm)	Absent	Scattered	(Common)	Abundant
Leaf litter depth	(Absent)	Single layer	Multiple layers	Deep layers
Leaf litter coverage	(Absent)	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	(Common)	Abundant
Rock piles	Absent	(Scattered)	Common	Abundant
Trees with shedding bark	Absent	Scattered	(Common)	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	(Absent)	Scattered	Common	Abundant
Mistletoe/Epiphytes	(Absent)	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Remnt veg, tests, mowly
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment:	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
Suitable – if all 4 questions are yes	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

targetzero
► zero incidents ► zero injuries

LAR 1236 Tetris

SITE IDENTIFICATION			
Site Name:	Hellhound 58	**Date:**	14. September
Tenure:	PL 1040	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	307823
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965462
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 180		#	
East	# 181		#	
South	# 182		#	
West	# 183		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	(Sandy loam)	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	(Grazing)	(Forestry)	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%		26-75%	(>76%)		n/a
Site condition	Very good	Good		Moderate	(Poor)		Degraded
Fire scars	Absent	Scattered	(Frequent)	**Time since**	(Recent)	Old	**Average Height (m)**	/6 m
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	(**SHR**)	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	(S1)	S2	G
Avg height (m) of EDL			**Avg DBH (cm) of EDL**		
Canopy cover (%) of EDL	>70% (dense/closed)	(30-70% (mid-dense))	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	(Mid-dense)	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect) 50 x 5m

Transect Start compass bearing	N	Start Easting	307848	End Easting	307798
		Start Northing	6965442	End Northing	6965469

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)	8 | 10				1 | 4	0.1 | 1
Canopy cover (%)					50	4

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia spetabilis		36					34	2
A. leiocarpa		42					39	3
Allocasuarina luehmanii		12					4	8
Eucalyptus cladocalyx		4	1				3	
corymbia clacksoniana		1	1				2	2
Acacia murrayana		4						
A. conferta		1					1	
Melaleuca nodosa		1					1	
Banksia aspera								
Lomandra patens								

2 x 6

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	184	185	186	187	188	
Native perennial grass						
Native other grass (if relevant)	10			10	10	
Native forbs and other species (non-grass)						
Native shrubs (<1m)	25	8	40	10		
Non-native grass						
Non-native forbs and shrubs						
Litter	5	2	10	10	30	
Rock						
Bare ground	60	90	50	70	60	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1	NA	LC	NOC
Survey result	11.5.1	NA	LC	NOC
Agree with mapped RE? If no, provide justification from field data				

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	8	No. of logs (>10cm)	3
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remnant veg
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

LAR 1236 Tetnis

SITE IDENTIFICATION			
Site Name:	Halford 95	Date:	19 September 2019
Tenure:	PL 1044	Assessor(s):	Pete Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	2989455
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6964876
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 264		#	
East	# 265		#	
South	# 266		#	
West	# 267		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	Absent	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	(Grazing)	(Forestry)	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	(26-75%)	>76%	n/a			
Site condition	Very good	(Good)	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	(Frequent)	**Time since**	(Recent)	Old	**Average Height (m)**	1c
Disturbance notes	Subject to severe wild fire.							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)		T2		S1		S2		G			
Avg height (m) of EDL					**Avg DBH (cm) of EDL**							
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		(10-30% (sparse))		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	(Dense/closed)		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; If confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

298934
289 ~~934~~

VEGETATION FLORISTICS (record all species within 50m x ~~10m~~ transect) 50 x 5

Transect Start compass bearing	S	Start Easting	298959	End Easting	6964 ~~886~~
		Start Northing	6964886	End Northing	6964 ~~886~~

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		10 16	4 10		1 4	0.2 1
Canopy cover (%)						

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia Spp.	Dodonaea sinuolata	71					57	14
prickly spp.	Mirbelia pungens	34					23	11
Allocasuarina	huehnaniii	19					11	8
Acacia	Rimbrida	6					6	
Eucalyptus	Cuebra	3		2			1	
Conostylis	setosa							
Anthistiria	Spp. medusae							

Spec Acc

S1 S2

A- Fuchsia S1 S2

Prickly Spec

NAI T1 S2 2 4

Mid Number S1

ORG-ARW-HSM-FOR-00067 (Parent Document Ecology Survey Guideline ORG-ARW-HSM-GUI-00010)
Released February 2017 - Version 5

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	268	269	270	271	272	
Native perennial grass		1T	5			
Native other grass (if relevant)			5			
Native forbs and other species (non-grass)						
Native shrubs (<1m)	10	70		40		
Non-native grass						
Non-native forbs and shrubs						
Litter	75	15	15	30	50	
Rock						
Bare ground	15		75	25	50	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1	PA	LC	Not
Survey result	11.5.1			
Agree with mapped RE? If no, provide justification from field data	Yes mapped by 3D Ecosmart			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs.				
Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)	Other Information (e.g. age, collected, active/inactive)
			Easting / Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	~~No~~	Report only
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No Yes / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

EAR 1236 Tetris

SITE IDENTIFICATION			
Site Name:	Halford 88	Date:	19 September 2019
Tenure:	PL 1040	Assessor(s):	Pete Hall

DEVELOPMENT TYPE & LOCATION					
Development Type				Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility			Easting (E)	300824
☐ Pilot Well + Dam	☐ Dam			Northing (N)	6965534
☐ Monitoring	☐ Pipeline			Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line			Other description	
☐ Work over	☐ Property (area) wide				

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 247		#	
East	# 248		#	
South	" 249		#	
West	" 250		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	(26-75%)	>76%	n/a							
Site condition	Very good	(Good)	Moderate	Poor	Degraded							
Fire scars	Absent	(Scattered)	Frequent	**Time since**	Recent	(Old)	**Average Height (m)**	2m				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	18				**Avg DBH (cm) of EDL**		30					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		(10-30% (sparse))		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		(Mid-dense)		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing			Start Easting		300816			End Easting		300833			
			Start Northing		6965516			End Northing		6965562			
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			15	23	12	15			1	4	0.2	1	
Canopy cover (%)													

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia spp.	Dodonaea sinuolata	102					55	47
Allocasuarina huchaeanii		51					16	35
Eucalyptus wandsiana		1		4				
Melaleuca nodosa	Melaleuca nodosa	1			1			
Lomandra spp.								
Native grass (not bam)								
Gahnia aspera								

Spec 1
Sp S1
47 5
20 30
B O T2
S1 S2
41 11
83 24
GTB
T1
3 t 1
mal nub
T2

Ecological Field Survey ORG ARW HSM FOR 0006

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	251	252	253	254	255	
Native perennial grass						
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)	10			50		
Non-native grass						
Non-native forbs and shrubs						
Litter	90	60	100	50	85	
Rock						
Bare ground		40			15	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11-5-1	NA	LC	NOC
Survey result	11-5-1			
Agree with mapped RE? If no, provide justification from field data	Yes. Mapped by 3D Ecosmart.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	6	Total length of logs (>10cm)	2	No. of logs (>10cm)	9
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs.					
Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	**Likely Species/Group**	**Conservation Status (see below)**	**Coordinates (GDA94)**		**Other Information (e.g. age, collected, active/inactive)**
			Easting	**Northing**	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		**If required, why?**
Fauna spotter/catcher	(Yes)	No	Burrows
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero

LAR 1236 Tetris

SITE IDENTIFICATION			
Site Name:	Halcon 85	Date:	19 September 2019
Tenure:	PL 1040	Assessor(s):	Peter Holl

DEVELOPMENT TYPE & LOCATION					
Development Type				Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility			Easting (E)	701 666
☐ Pilot Well + Dam	☐ Dam			Northing (N)	6965576
☐ Monitoring	☐ Pipeline			Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line			Other description	
☐ Work over	☐ Property (area) wide				

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 238		#	
East	# 239		#	
South	# 240		#	
West	# 241		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	(N)	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	(Pale)	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	(Forestry)	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	(Logging)	Thinning	No disturbance						
Dieback	0%	1-25%	(26-75%)	>76%	n/a							
Site condition	Very good	(Good)	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	(Frequent)	**Time since**	(Recent)	Old	**Average Height (m)**	4				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2			S1			S2		G
Avg height (m) of EDL	15					**Avg DBH (cm) of EDL**			30			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			(10-30% (sparse))			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			(Mid-dense)			Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	N		Start Easting		301 603			End Easting		301 612			
			Start Northing		696 5552			End Northing		696 5601			
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			10	18	4	10			1	4	0.2	1	
Canopy cover (%)			20						50		4		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
~~Acacia~~ 1. Dodonaea sinuolata		67			42		25	
A. sp 2 (Fimbriata)	Acacia fimbriata	4					4	
Eucalyptus chloroclada		1			1			
E. crebra		4		3			1	
Alloxylon wickhamii		15					5	10
Acacia murrayana		10					10	
Gahnia aspera								
Lomandra polyas								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	242	245	246	245	246	
Native perennial grass						
Native other grass (if relevant)				10		
Native forbs and other species (non-grass)						
Native shrubs (<1m)	5		35		20	
Non-native grass						
Non-native forbs and shrubs						
Litter	75	65	15	40	20	
Rock						
Bare ground	20	35	50	50	60	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1	Nx	LC	Not
Survey result	11.5.1			
Agree with mapped RE? If no, provide justification from field data	Yes. Field verified RE mapping by 3D Reconnect.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	2	No. of logs (>10cm)	2
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	~~No~~	Commitment
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero ► zero incidents ► zero injuries

LAR 1236 Tetris

SITE IDENTIFICATION			
Site Name:	Helifuel 78	**Date:**	19 September 2019
Tenure:	PL 1040	**Assessor(s):**	Pellet Heli

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	304005
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965568
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (50)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 220		#	
East	# 221		#	
South	# 222		#	
West	# 223		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	(Orange)	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	(Sand)	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%		26-75%	>76%	n/a						
Site condition	Very good	Good		Moderate	Poor	Degraded						
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	2				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1		S2		G		
Avg height (m) of EDL	13				**Avg DBH (cm) of EDL**	20						
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a		
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse		Very sparse		Absent		

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; If confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing		Start Easting	304031	End Easting	305982
		Start Northing	6965562	End Northing	6965574

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		10 16	34 10		1 4	0.7 4
Canopy cover (%)		6%.	6%.		15%.	5%

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus angustifolia		13		5	7		1	
Allocasuarina inophloia		3			1		2	
Acacia concinna		13						13
Xanthorrhoea Leucopogon muticus		4					4	
Dodonaea		16					1	15
Eucalyptus chlorocalyx		1					1	
Aristida caput-medusae								
Thoracostachyum								
Aristida calycina								

Hop bush S2 7x 9 1

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	224	225	226	227	228	
Native perennial grass						
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	5	40	90	35	6	
Rock						
Bare ground	95	60	10	65	94	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	~~[illegible]~~ 11.5.6	NA	LC	NOC
Survey result	11.5.4			
Agree with mapped RE? If no, provide justification from field data	~~No~~ Yes. Mapped by 3D Ecosmart			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	6.5	No. of logs (>10cm)	3
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	~~Absent~~		Present	
Wetland / Swamp / Waterbody	~~Absent~~		Present	
Waterway	~~Absent~~		Present	
Potential for nectar / pollen	Absent	Scattered	~~Common~~	Abundant
Potential for fleshy fruiting plants	~~Absent~~	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	~~Common~~	Abundant
Dense shrub/grass shelter	Absent	Scattered	~~Common~~	Abundant
Large Eucalypts (>30cm DBH)	Absent	~~Scattered~~	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	~~Common~~	Abundant
Large rocks (>30cm)	~~Absent~~	Scattered	Common	Abundant
Small rocks (10-30cm)	~~Absent~~	Scattered	Common	Abundant
Leaf litter depth	Absent	~~Single layer~~	Multiple layers	Deep layers
Leaf litter coverage	Absent	~~Scattered~~	Common	Abundant
Termite mounds (>50cm)	Absent	~~Scattered~~	Common	Abundant
Rock piles	~~Absent~~	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	~~Common~~	Abundant
Soil cracks	~~Absent~~	Scattered	Common	Abundant
Koala feed trees	Absent	~~Scattered~~	Common	Abundant
Mistletoe/Epiphytes	~~Absent~~	Scattered	Common	Abundant

1+4
1+1
1+1.5

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Rm veg
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	Yes / (No)		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

N side of creek to have more wetter vegetat

East face of the transect

North face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

targetzero ► zero incidents ► zero injuries

EAP 1231 Tetris

SITE IDENTIFICATION			
Site Name:	Halliford 82	**Date:**	19 September 2019
Tenure:	PL 1040	**Assessor(s):**	Peter Ng II

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	302476
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965532
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 229		#	
East	# 230		#	
South	# 231		#	
West	# 232		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	(Yellow)	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	('Sand')	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	(Forestry)	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	(Logging)	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	(Very good)	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	(Frequent)	**Time since**	(Recent)	Old	**Average Height (m)**	6m				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)	T2	S1	S2	G							
Avg height (m) of EDL			**Avg DBH (cm) of EDL**	65								
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	(10-30% (sparse))	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	(Very sparse)	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	N.	Start Easting		302470		End Easting		302477					
		Start Northing		6965506		End Northing		6965554					
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			15	24	4	15			1	4	0.1	1	
Canopy cover (%)													

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Angophora leiocarpa		4		4				
Eucalyptus chloroclada		1					1	
woody pear Xylomelum cunninghamianum		2			1			1
Lysicarpus angustifolia		4			4			
Sacteksonia scoparia		1					1	
Acacia sp. 1								
Banksia aspera								
Hemiandra pungens								

Ang Leio
T1
E clad
S1
woody Pea
S1 T2 S2
Ac sco
T2
Ban sp
S1

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2		4	5	Mean
Photo #	233	234	235	236	237	
Native perennial grass					25	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)	20					
Non-native grass						
Non-native forbs and shrubs						
Litter	80	100	25	80	65	
Rock						
Bare ground			75	20	10	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	Not	Not	NOC
Survey result	11.7.4			
Agree with mapped RE? If no, provide justification from field data	Yes Mapped by 3D Ecosmart			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	1	No. of hollow logs	0	Total length of logs (>10cm)	2	No. of logs (>10cm)	1
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	(Abundant)
Potential for **fleshy fruiting plants**	(Absent)	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	(Scattered)	Common	Abundant
Dense shrub/grass shelter	Absent	(Scattered)	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	(Abundant)
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	(Common)	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	(Absent)	Scattered	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	(Common)	Abundant
Termite mounds (>50cm)	(Absent)	Scattered	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	Absent	(Scattered)	Common	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	(Common)	Abundant
Mistletoe/Epiphytes	Absent	Scattered	(Common)	Abundant

targetzero ► zero incidents ► zero injuries

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign. Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remnant vegetation
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero

GAR 1236 Tetuis

SITE IDENTIFICATION			
Site Name:	Rathlea 97	**Date:**	20 September 2019
Tenure:	PL 1040	**Assessor(s):**	Peter Klatt

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	303142
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6963596
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 292		#	
East	# 293		#	
South	# 294		#	
West	# 295		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	(Orange)	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	(Sand)	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	(Logging)	Thinning	No disturbance						
Dieback	0%	1-25%	(26-75%)	>76%	n/a							
Site condition	Very good	(Good)	Moderate	Poor	Degraded							
Fire scars	Absent	(Scattered)	Frequent	**Time since**	Recent	(Old)	**Average Height (m)**	2m				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)	T2	S1	S2	G							
Avg height (m) of EDL	12		**Avg DBH (cm) of EDL**	20								
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	(<10% (very sparse))	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	(Sparse)	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	~~Not Found On Site~~
Weed infestations	Found on Site – records below	~~Not Found On Site~~

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)											
Transect Start compass bearing	E	Start Easting	303 119		End Easting	303166					
		Start Northing	6963 609		End Northing	6963597					
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		9	17	4	9			1	4	0.1	1
Canopy cover (%)		6						20		5	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
~~Hetl~~ ngete	Leucopogon muticus	41					41	
Xylomoia cunninghamii		38			3			38
Ancathera leiocarpa		2		1				1
Acacia murrayana		5					2	3
Trichosania scopulacea		1					1	
Callit. S-glaucophylla		3		3				
corymbia clarksoniana		1		1			~~1~~	
Eucalyptus ~~decidata~~ chlorocladia		3 ~~1~~		1			1	1
Aristida caput-medusae								
A. calycina								
Phaegnaceae Tetrarium	vaccinosum							
Lomandra pedana								

HM
4(5)
BCP
T1
SBM
T1 S1
2 3
WP
S1 S2
T2 1 3
1 1
A. murrayc
S1 12
2 3
Jarlan
S1
RBU
T1
E. decidua BCP
S1 T1
T1 2

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targetzero
► zero incidents ► zero injuries

Common name/collection name	**Species name**	**Sample (Field No.)**	**Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed**					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	286	297	298	299	300	
Native perennial grass					30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)		15				
Non-native grass						
Non-native forbs and shrubs						
Litter	3	15	65	100	45	
Rock						
Bare ground	97	70	35		25	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.9.4	NA	LC	NOC
Survey result	11.5.1	NA	LC	NOC
Agree with mapped RE? If no, provide justification from field data	No - Area mapped by 3D Ecosmart			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	6	No. of logs (>10cm)	7.5
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

424 6×7.5

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	**Likely Species/Group**	**Conservation Status (see below)**	**Coordinates (GDA94)**	**Other Information (e.g. age, collected, active/inactive)**
			Easting / **Northing**	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Remnant Used
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero ► zero incidents ► zero injuries

LAR 1236 Tetris

SITE IDENTIFICATION			
Site Name:	Halstead 76	Date:	20 September 2019
Tenure:	PL1040	Assessor(s):	Pete Hall

DEVELOPMENT TYPE & LOCATION					
Development Type				Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒	Well pad	☐	Gas Processing Facility	Easting (E)	304 535
☐	Pilot Well + Dam	☐	Dam	Northing (N)	6965017
☐	Monitoring	☐	Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐	Roads & Tracks	☐	Seismic Line	Other description	
☐	Work over	☐	Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 282		#	
East	# 283		#	
South	# 284		#	
West	# 285		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	(N)	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	(Yellow)	Orange	Brown	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	(Sand)	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	(Grazing)	(Forestry)	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	(Logging)	Thinning	No disturbance		
Dieback	0%	1-25%		(26-75%)	>76%	n/a		
Site condition	Very good	Good		(Moderate)	Poor	Degraded		
Fire scars	Absent	Scattered	(Frequent)	Time since	(Recent)	Old	Average Height (m)	10
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	CEST	Rf	H	FOR	(WDL)	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)		T2		S1		S2		G			
Avg height (m) of EDL	17				Avg DBH (cm) of EDL		40					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		(<10% very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		(Sparse)		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	W 270°	Start Easting	304561	End Easting	306512
		Start Northing	6965016	End Northing	6965025

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		12 – 18	3 – 12		1 – 3	0.1 – 1
Canopy cover (%)						

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina inophloia		34			2		25	7
Angophora leiocarpa		6		1			2	3
Corymbia clarksoniana		4		1			3	
Eucalyptus crebra		3					1	2
~~Corymbia clarksoniana~~		~~*~~					*	
Acacia leiocarpa		1					1	
A. murrayana		1					1	
Heath myrtle Leucopogon muticus		1					1	
Lomandra pubens								
Austrostipa scabra								
Dodonaea bilobata								
Schoenus apogon								
Phaseolus Tetuicum racemosum								
Austrodanthonia caput-medusae								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	286	287	288	289	290	
Native perennial grass						
Native other grass (if relevant)		15				
Native forbs and other species (non-grass)						
Native shrubs (<1m)				25		
Non-native grass						
Non-native forbs and shrubs						
Litter	15	~~45~~	30	55	60	
Rock						
Bare ground	85	40	70	30	40	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.4	NA	LC	Not
Survey result	11.5.4			
Agree with mapped RE? If no, provide justification from field data	Yes. Mapping by 3D Ecosmart.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	14	No. of logs (>10cm)	6
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

4 of 12

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remnant Vegetation
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	Halifax 73	**Date:**	20 September 2019
Tenure:	PL1040	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	305368
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6964981
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 273		#	
East	# 274		#	
South	# 275		#	
West	# 276		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	('Loamy sand')	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	(Grazing)	(Forestry)	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%		26-75%	(>76%)	n/a		
Site condition	Very good	Good		Moderate	(Poor)	Degraded		
Fire scars	Absent	Scattered	(Frequent)	**Time since**	(Recent)	Old	**Average Height (m)**	10 m
Disturbance notes	Subject to severe wildfire							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2			S1			S2		G
Avg height (m) of EDL	6 m					**Avg DBH (cm) of EDL**						
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			10-30% (sparse)			(<10% (very sparse))		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			(Sparse)			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	N		Start Easting	305361			End Easting	305374					
			Start Northing	6964959			End Northing	6950 10					
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			3	7					1	3	0.7	1	
Canopy cover (%)			6						20				
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed										
NB: Record ground cover species within 50m x 10m transect			E		T1		T2		T3		S1		S2
		TOTALS											
Melaleuca nodosa		4			4								
Eucalyptus cloeziana		18									3		15
Acacia spec Dodonaea sinuolata		5									2		3
Allocasuarina luehmannii		51									28		23
Angophora leiocarpa		2									2		
Lonarda peltata													

Ecological Field Survey ORG-ARW-HSM-FOR-00067

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	277	278	279	280	281	
Native perennial grass						
Native other grass (if relevant)					25	
Native forbs and other species (non-grass)						
Native shrubs (<1m)			12	45		
Non-native grass						
Non-native forbs and shrubs						
Litter	2	15	10	10	15	
Rock						
Bare ground	98	85	78	45	60	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.4	NA	LC	NOC
Survey result	11.5.4			
Agree with mapped RE? If no, provide justification from field data	Yes - mapped by 3D Ecosmart.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	6	No. of logs (>10cm)	4
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remnant veg
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Halliford 94 + gathering to N	Date:	15/10/19
Tenure:	PL1040	Assessor(s):	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	299699
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6964794
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 33		#	
East	# 34		#	
South	# 35		#	
West	# 36		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	(Nil)
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

targetzero
► zero incidents ► zero injuries

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	3				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	12				**Avg DBH (cm) of EDL**							
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	299704	End Easting	299696
		Start Northing	6964818	End Northing	6964768

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)	1	11 | 13	8 | 10	5 | 6	0.5 | 1	0.1 | 0.5
Canopy cover (%)		10	20	5	5	5

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina littoralis		92						
Paperbark - small leaf	Melaleuca decora	1				1		
Eucalyptus gardiana		3		3				
Fern leaf dodonaea -	Dodonaea simulata	1						1
Callitris glaucophylla		1		1				
Aristida capit-medusae								
Dianella sp.								
Lomandra								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	37		39		41	
Native perennial grass	5	2	10		2	3.8
Native other grass (if relevant)						
Native forbs and other species (non-grass)		1			5	1.2
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	95	87	75	95	20	74.4
Rock						
Bare ground		10	15	5	73	20.6
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1/11.5.4 & 11.5.20	NA	LC	NCAP
Survey result	〃	〃	〃	〃
Agree with mapped RE? If no, provide justification from field data	↑Dominated by E. woolsiana, not E. crebra or E. chloroclada.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	10.5	No. of logs (>10cm)	6
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	210	Per hectare (x 20)	120

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Trees >1.4m
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-0000x7

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Halliford 84 & Gathering	**Date:**	15/10/19
Tenure:	PL1040	**Assessor(s):**	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	300486
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6964611
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 42		#	
East	# 43		#	
South	# 44		#	
West	# 45		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	(Nil)
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	~~Absent~~		(Scattered)	Frequent				
Erosion Type	Tunnelling	(Sheet)	Rill	Gully	Mass failure	Stream-bank		

- balds scattered

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	6				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2			G
Avg height (m) of EDL	15					**Avg DBH (cm) of EDL**			25			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	~~B~~ SW	Start Easting	300509	End Easting	300462
		Start Northing	6964618	End Northing	6964604

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		14 | 18	~~8~~ | 12	3 ~~4~~ | ~~8~~ 5	1 | 1.5	05 | 1
Canopy cover (%)		5	10	15	30	50

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) - Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina littoralis		9			11 (2)		1 (1)	~~IIII~~ 1 (6)
Dodonaea simulata		16				1 (1)	~~IIII IIII~~ 111 (13)	11 (2)
Hakea sericea		3						111 (3)
Acacia ulicifolia		33					~~IIII IIII~~ (25) ~~IIII IIII~~ 111	~~IIII IIII~~ 11 (7)
Eucalyptus crebra		1		1 (1)				
Dianella sp.								
Grevillea asparagoides								
Callitris glaucophylla		1			1 (1)			
Aristida jerichoensis								
Spiny bush	Daviesia genistifolia	1						1 (1)

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	46	47	48	49	~~50~~	
Native perennial grass			5	10		3.75
Native other grass (if relevant)						
Native forbs and other species (non-grass)		30				7.5
Native shrubs (<1m)	20	30				12.5
Non-native grass						
Non-native forbs and shrubs						
Litter	60	40	85	75		65
Rock						
Bare ground	20		10	15		11.25
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1/11.5.20/11.3.25	N/A	LC	OC
Survey result	11.5.1	N/A	LC	NCAP
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	1 (1)	Total length of logs (>10cm)	(40)	No. of logs (>10cm)	(14)
Per hectare (x 20)	0	Per hectare (x 20)	20	Per hectare (x 20)	920	Per hectare (x 20)	280

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Trees 7-4m
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

RoW to W is like Halliford 94

- Similar vegetation at - Halliford 86 & LTE tower - 301314 6964 972 NESW photos 50 - 53
- Halliford 84 - 302232 6964 794 photos 54-57
  - budgeroo replaces A. luehmannii
  - Micromyrtus in S1 & S2
- Halliford 61 - Thinner understory in some places
  - Photos 58-61 302559 6964051

North face of the transect

East face of the transect

South face of the transect

West face of the transect

target zero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Hallsford 87	**Date:**	15/10/19
Tenure:	PL1040	**Assessor(s):**	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	301671
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6964360
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 62		#	
East	# 63		#	
South	# 64		#	
West	# 65		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	(Nil)
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	(Sandy loam')	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent			(Scattered)		Frequent		
Erosion Type	Tunnelling	(Sheet)	Rill	(Gully)	Mass failure	Stream-bank		

V Bads

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	3				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2			G
Avg height (m) of EDL	17					**Avg DBH (cm) of EDL**			30			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	301666	End Easting	301681
		Start Northing	6964386	End Northing	6964338

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)	1	15 19	10 13	3 5	1 1.5	0.1 0.5
Canopy cover (%)		7	10	10	5	5

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Woody pear	Xylomelum cunninghamianum	12					11 (2)	~~11~~ ~~11~~ (10)
Pink flower shrub	Homalocalix polyandrus	10					~~11~~ (5)	~~11~~ ~~11~~ (5)
Microcorythus sample	Brachyloma daphnoides	4						1111 (4)
Acacia sample	Acacia hakeoides	8				1111 (4)	111 (3)	1 0
Agastachys odorata		5		11 (2)			11 (2)	1 0
Wide-leaf dodonaea	Dodonaea bilobata	2					11 (2)	
Banksia sp.	Lasiocarpus angustifolius	12			111 (3)	1111 (5)	1 (1)	111 (3)
Eucalyptus chloroclada		6				1111 (4)	1 (1)	1 (1)
Undetermined - leaflets	Eucarpus aphyllus	2						11 (2)
Allocasuarina huegeliana		10				1 (1)	1111 (4)	~~11~~ (5)
Aristida caput medusae								
Woolly lomandra	Lomandra leucocephala							
Xanthorrhoea sp. johnsonii								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	66	67	68	69	70	
Native perennial grass			2	10	10	4.4
Native other grass (if relevant)						
Native forbs and other species (non-grass)	2	60		10		14.4
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	50	30	50			26
Rock						
Bare ground	48	10	49	80	90	54.2
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1/11.5.20/11.5.4	N/A	LC	NCAP
Survey result	11.5.4	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect 51							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	12	Total length of logs (>10cm)		No. of logs (>10cm)	11
Per hectare (x 20)	0	Per hectare (x 20)	40	Per hectare (x 20)	1020	Per hectare (x 20)	220

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	(Yes) / No (Yes) / No (Yes) / No (Yes) / (No)		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Similar: - Hallford 83 - photo 71-74 303043 6964768
- More disturbed, sparser.

- photo 75-78 303794 6964823
- A. inophloia replaces budgeroo in patches

to 83 303769 6464088
- Same as above, E. crebra & brown bloodwood to dominate canopy

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	Halliford ~~Fite~~ 104 gathering	Date:	8/2/21
Tenure:	PL199	Assessor(s):	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	309940
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6962671
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 285		#	
East	# ↓		#	
South	#		#	
West	# 288		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: Road clearing		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	2.5		**Avg DBH (cm) of EDL**	3	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	N	Start Easting	309941	End Easting	309941
		Start Northing	6962646	End Northing	6962647

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)					2 | 3	0.5 | 1
Canopy cover (%)					30	10

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia leiocalyx		35					IIII (24)	
Callitris glaucophylla		18					||||| ||||| |||	||||| ||||| ||| (18)
Eucalyptus chloroclada		6					I	||||| (5)
Melaleuca nesophila		2						|| (2)
Pomaderris ericifolia								
Callitris columellaris								
Oxalis sp.								
* Portulaca pilosa								
* Wedelia dussii (dubia) Eriocoma banarensis								
Elymus scaber								
Muhlenbergia gracillima Thyridolepis mitchelliana								
Lomandra laxa								
* Comphrena coelesioides								
Lomandra filiformis pedunculata Glycine clandestina								
Eragrostis leptostachya								
Aristida ramosa								
Goodenia sp.								
* Glandularia aristigera								
Centipeda minima								
Chrysocephalum apiculatum								
Ariotina capsit-medusae								
~~Stachys stida~~								

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
+ Sida spinosa								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	289	290	→	→	293	
Native perennial grass	2	5	25		5	7.4
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)		10	15			5
Non-native grass						
Non-native forbs and shrubs			5			1
Litter	8	5	35	80	30	25.6
Rock						
Bare ground	90	80	20	50	65	61
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cleared (SD)	NA	NA	NA
Survey result	"	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES, cleared			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	4	No. of logs (>10cm)	1
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	80	Per hectare (x 20)	20

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Informati (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Log piles from clearing
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	(Yes) / No (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	Hallford 100	**Date:**	8/12/21
Tenure:	PL1040	**Assessor(s):**	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	310241
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6962056
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 304		#	
East	# ↓		#	
South	# ↓		#	
West	# 307		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	(N)	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	(Orange)	Brown	Red	Black	Grey	(Pale)	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	Absent			(Scattered)		Frequent
Erosion Type	Tunnelling	(Sheet)	Rill	Gully	Mass failure	Stream-bank

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2			S1			S2		G
Avg height (m) of EDL			3				**Avg DBH (cm) of EDL**			3		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Balloon cotton Gomphocarpus physocarpus	Scattered	throughout pad			
Opuntia tomentosa	"	"			

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing		Start Easting	310240	End Easting	310239		
		Start Northing	6962029	End Northing	6962081		
Stratum	E	T1	T2	T3	S1		S2/Seedlings
Height range (m)					2	4	0-5
Canopy cover (%)					15		10

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Alpiniaria exceba		21					11 (2)	18+1 (19)
Acacia leiocalyx		22					1111 1111 1111 (15) 11 (17)	1111 1111 1111 (19)
* Balloon cotton	Gomphocarpus physocarpus	19						
Arthraxon hispidus	Tenorium juncetum	1					(1)	
Acacia conferta		3						111 (3)
Galenia asperula								
Calotis cuneifolia								
Wahlenbergia gracilis								
Red natal	Melinis repens							
Long awned grass (photo)	Austrostipa verticillata							
Oxalis sp.								
Cyperus gracilis								
Solanum ellipticum								
Cheilanthes sieberi								
Hibiscus sturtii								
Carex sp.								
* Woody daisy (photo)	Erigeron bonariensis							
* Glandularia aristigera								
* Shrubby sida	Sida spinosa							
Aristida capito-medusae								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m **plot**) or (50m x **2m** plot for dense cover in S1 and S2) – **Denote** plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	308	→	→	→	312	
Native perennial grass	60	30	75		40	47
Native other grass (if relevant)						
Native forbs and other species (non-grass)		10	20	50	40	24
Native shrubs (<1m)	20	60				16
Non-native grass						
Non-native forbs and shrubs						
Litter					5	1
Rock						
Bare ground	20	10	5	20	5	12
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cleared (3D)	NA	NA	NA
Survey result	〃	〃	〃	〃
Agree with mapped RE? If **no**, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species	
V	Vulnerable		
NT	Near Threatened		
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds	
CBS	Colonial Breeding Species		

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Scattered trees >4m
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes (No) (Yes) No Yes (No) (Yes) No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	Halliford ~~Fite~~ 104 gathering	Date:	8/2/21
Tenure:	PL199	Assessor(s):	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	309940
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6962671
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 285		#	
East	# ↓		#	
South	#		#	
West	# 288		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: Road clearing		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	2.5		**Avg DBH (cm) of EDL**	3	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	N	Start Easting	309941	End Easting	309941
		Start Northing	6962646	End Northing	6962647

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)					2 | 3	0.5 | 1
Canopy cover (%)					30	10

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia leiocalyx		35					IIII (24)	
Callitris glaucophylla		18					||||| ||||| |||	||||| ||||| ||| (18)
Eucalyptus chloroclada		6					I	||||| (5)
Melaleuca nesophila		2						|| (2)
Pomaderris ericifolia								
Callitris columellaris								
Oxalis sp.								
* Portulaca pilosa								
* Wedelia dussii (dubia) Eriocoma banarensis								
Elymus scaber								
Muhlenbergia gracillima Thyridolepis mitchelliana								
Lomandra laxa								
* Comphrena coelesioides								
Lomandra filiformis pedunculata Glycine clandestina								
Eragrostis leptostachya								
Aristida ramosa								
Goodenia sp.								
* Glandularia aristigera								
Centipeda minima								
Chrysocephalum apiculatum								
Ariotina capsit-medusae								
~~Stachys stida~~								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
+ Sida spinosa								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	289	290	→	→	293	
Native perennial grass	2	5	25		5	7.4
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)		10	15			5
Non-native grass						
Non-native forbs and shrubs			5			1
Litter	8	5	35	80	30	25.6
Rock						
Bare ground	90	80	20	50	65	61
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cleared (SD)	NA	NA	NA
Survey result	"	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES, cleared			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	4	No. of logs (>10cm)	1
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	80	Per hectare (x 20)	20

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Informati (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Log piles from clearing
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	(Yes) / No (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	Halford 106	**Date:**	8/2/21
Tenure:	PL 198	**Assessor(s):**	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	310466
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6963495
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 276		#	
East	# ↓		#	
South	# ↓		#	
West	# 279		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

(Access track)

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	4				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	20				**Avg DBH (cm) of EDL**		40					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	310461	End Easting	310472
		Start Northing	6963519	End Northing	6963471

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		20 | 25	8 | 10	4 | 5	1 | 2	0·1 | 0·5
Canopy cover (%)		20	30	5	15	1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Bur (photo)	Salsola australis							
Paniceum effusum								
Eragrostis sororia								
Fimbristylis dichotoma								
Brunoniella australis								
Solanum eliptieum								
Hairy grass (photo)	Digitaria brownii							
Einadia nutans								
Aristida caput-medusae								
Blue creeper	Evolvulus alsinoides							
Cahnisa aspera								
Lomandra leka								
Sarcostemma photo	Tenaxium junceum							
Portulaca australis								
Aneistachys inundata								
Acacia coriacea		2			(2)		(1)	
Amaphora leucacapa		1		(1)				
Acacia leiocalyx		25					(18) (2)	(9)
Alloeasuarina littoralis		5			(1) (2)	(1)	(1)	
Callitris glaucophylla		27		(3)		(4)		
Eucalyptus crebra		4		(3)				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	280	→	→	→	284	
Native perennial grass	30	5	20	10	5	14
Native other grass (if relevant)						
Native forbs and other species (non-grass)	30	10	25	10	25	20
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	35	15	55	50	70	45
Rock						
Bare ground	5	70		30		21
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1(3D)	NA	LC	NCAP
Survey result	11	11	11	11
Agree with mapped RE? If **no**, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	5	Total length of logs (>10cm)	21 1+6+4+1 +9	No. of logs (>10cm)	7
Per hectare (x 20)	0	Per hectare (x 20)	100	Per hectare (x 20)	420	Per hectare (x 20)	140

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Trees 74m
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / No Yes / No Yes / No Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	Halliford 102	**Date:**	9/2/21
Tenure:	PL1040	**Assessor(s):**	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	310162
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6961406
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 325		#	
East	# 1		#	
South	# V		#	
West	# 328		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	~~'Sandy loam'~~	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	(Absent)	Scattered	Frequent
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	2-5				
Disturbance notes	Fire Significant fire damage killed T1, dense regrowth Acacia											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	2-5					**Avg DBH (cm) of EDL**	2					
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	~~SW~~	Start Easting	316195	End Easting	316146
		Start Northing	6961427	End Northing	6961396

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)					~~2~~ 4	0.5 1.5
Canopy cover (%)					75	40

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed

NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia leiocalyx		49					(36)	(13) (10)
Alphitonia excelsa		10						
Acacia concorta		1						(1)
Eucalyptus crebra		2					(1)	
Acacia salicina		1						
Callitris glaucophylla		1						
Angophora leiocarpa		1					(1)	
* Shrubby sida	Sida spinosa							
Solanum ellipticum								
Eragrostis leptostachya								
Glycine (hairy, wide leaflets)	Glycine tomentella							
Oxalis sp.								
Aristida caput-medusae								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	329	→	→	→	333	
Native perennial grass	98	40	30	20	25	42.6
Native other grass (if relevant)						
Native forbs and other species (non-grass)	2					0.4
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter		50	70	80	50	50
Rock						
Bare ground		10			25	7
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.4 (3D)	NA	LC	NCAP
Survey result	〃 〃	〃	〃	〃
Agree with mapped RE? If no, provide justification from field data	YES, heavily disturbed by fire.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	2+8+7+5 (22)	No. of logs (>10cm)	VII (4)
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	440	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Scattered trees >4m & stags
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero

SITE IDENTIFICATION			
Site Name:	Halliford 300	Date:	10/2/21
Tenure:	PL1040	Assessor(s):	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	310772
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6958274
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 384		#	
East	# ↓		#	
South	# ↓		#	
West	# 387		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion		(Absent)		Scattered		Frequent		
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:				
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance				
Dieback	0%	1-25%	26-75%	>76%	n/a					
Site condition	Very good	Good	Moderate	Poor	Degraded					
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	3		
Disturbance notes										

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	~~**WDL**~~	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).										
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G	
Avg height (m) of EDL	2.5				**Avg DBH (cm) of EDL**		2			
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	N	Start Easting	310285	End Easting	310273		
		Start Northing	6958254	End Northing	6958295		
Stratum	E	T1	T2	T3	S1	S2/Seedlings	
Height range (m)		10 | 15			1·5 | 3	0·3 | 0·5	
Canopy cover (%)		10			40	5	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed

NB: Record ground cover species within 50m x 10m transect

			E	T1	T2	T3	S1	S2
		TOTALS						
Aristida caput-medusae								
Eragrostis leptostachya								
Eragrostis nutans								
Solanum ellipticum								
Cyperus aristus								
Lomandra laxa								
* Sida sp. Mulloy	Sida spinosa							
Diamella heterophylla								
* Portulaca pilosa								
Hardenbergia violacea								
* Weedy daisy	Erigeron bonariensis							
Dodonaea viscosa		1						
E. chloro	Eucalyptus ethanoclada	2					(1)	
Angophora leiocarpa		2					II (2)	
Callitris glaucophylla		3					(1)	(1)
Eucalyptus crebra		43						III (3)
Acacia leiocalyx		19					~~IIII~~ III (14)	~~IIII IIII IIII IIII~~ (29)
							IIII (14)	(5)

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
			E	T1	T2	T3	S1	S2
NB: Record ground cover species within 50m x 10m transect								
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	388	→	→	→	392	
Native perennial grass	85	15	20	5	20	29
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5	15	10	5	10	9
Native shrubs (<1m)			30		~~50~~ 50	~~16~~
Non-native grass						
Non-native forbs and shrubs						
Litter	10	60	~~2025~~	90	5	38
Rock						
Bare ground		10	15		15	8
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4 (3D)	NA	LC	NCAP
Survey result	"	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES, heavily disturbed by fire			

FAUNA HABITAT within 50m x 10m transect (37)							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	IIII (4)	Total length of logs (>10cm)	5+4+6+1+4+10	No. of logs (>10cm)	~~IIII~~ (11)
Per hectare (x 20)	0	Per hectare (x 20)	80	Per hectare (x 20)	740	Per hectare (x 20)	220

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Stags & logs
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	~~Hatliford~~ Tipton 363	**Date:**	10/2/21
Tenure:	PL198	**Assessor(s):**	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	310821
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6957764
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 397		#	
East	# ↓		#	
South	# ↓		#	
West	# 400		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	Absent			(Scattered)		Frequent		
Erosion Type	Tunnelling	~~Sheet~~	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%		26-75%	>76%		n/a	
Site condition	Very good	Good		Moderate	Poor		Degraded	
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)					
Macrohabitat(s) present	**CEST** **Rf** **H** **FOR** **WDL** **GRL** **IMP** **LKE** **RIP** **SHR** **SW** **DIS**				
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).					
Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	2		**Avg DBH (cm) of EDL**	3	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
O. tomentosa					
O. stricta					

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	ENE	Start Easting	310797	End Easting	310844
		Start Northing	6957755	End Northing	6957773

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)					2 | 3	0.5 | 1
Canopy cover (%)					20	10

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
A. caput	Aristida caput-medusae							
E. sororia	Eragrostis sororia							
Centipeda minima								
Fimbristylis dichotoma								
Dichanthium sericeum								
Sporobolus jike cordi	Sporobolus scabriculus							
* Glandulana aristigera								
* Portulaca oleracea								
* P. pilosa	Portulaca pilosa							
Wavy leaf saltbush	Atriplex muelleri							
Enteropogon acicularis								
* Gomphrena celosioides								
Solanum ellipticum								
Eragrostis (purple)	Eragrostis leptostachya							
* Weedy daisy	Erigeron bonariensis							
Eriochloa crebra								
Melaleuca microphylla		2						II (2)
A. leh	Allocasuarina luehmannii	2						II (2)
E. pop	Eucalyptus populnea	14					4 IIII, I (6)	IIII III (8)
Eucalyptus crebra		7						IIII II (7)

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	401	→	→	→	405	
Native perennial grass	50	50	30	25	40	39
Native other grass (if relevant)						
Native forbs and other species (non-grass)	30	30	20	5	30	23
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	20	5	5	10	30	14
Rock						
Bare ground		15	45	60		24
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cleared (3D	NA	NA	NA
Survey result	〃	〃	〃	〃
Agree with mapped RE? If **no**, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	1	Total length of logs (>10cm)	III (3)	No. of logs (>10cm)	II (2)
Per hectare (x 20)	0	Per hectare (x 20)	20	Per hectare (x 20)	60	Per hectare (x 20)	40

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	Yes	No	
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment:	Yes / No		Is the vegetation suitable for slashing only?
Suitable – if all 4 questions are yes	Yes / No		Is the slope < 5%?
	Yes / No		Is the clay content > 20%?
	Yes / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	No	
Notes			

gathering to SE is same with less regrowth shrubs

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero

Boundary Road Part 1

SITE IDENTIFICATION			
Site Name:	Tipton 633	Date:	16 Feb 2021
Tenure:	PL 198	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION					
Development Type				Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility			Easting (E)	311054
☐ Pilot Well + Dam	☐ Dam			Northing (N)	6957151
☐ Monitoring	☐ Pipeline			Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line			Other description	
☐ Work over	☐ Property (area) wide				

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 28		#	
East	# 29		#	
South	# 30		#	
West	# 31		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

PHYSIOGRAPHY estimated ~~within ESU or~~ 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	~~Brown~~	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	CEST	Rf	H	FOR	WDL	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2			G
Avg height (m) of EDL						**Avg DBH (cm) of EDL**						
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa					
O. stricta					

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey ORG-MGT-FRM-[illegible] targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	N	Start Easting	311056	End Easting	311054
		Start Northing	6957132	End Northing	6957184

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		6 | 13			1 | 4	0.1 | 1
Canopy cover (%)		8				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus populnea		2					2	
E. crebra		8		4			4	
~~Ge~~ Pittosporum ~~phy~~ angustifolium		14					12	2
Opuntia tomentosa		1					1	
Paspalidium caboidea								
Panicum decompositum								
Fimbristylis dichotoma								
Eragrostis australis								
Cyperus bifax								
Enteropogon ramosus								
~~Pycnostachys sp~~	Calocephalus sonderi							
Glandularia aristisepala								
Gomphrena celsioides								
~~Botriochloa~~ ~~bladhii~~	Bothriochloa bladhii							
Sida subspicata								
~~Eragrostis~~ migrans	Eragrostis sororia							
Brachyscome dentata								
Chiolanthes sieberi v sieberi								

E. Po
S1
NR1
S1 S2
66
S1 S2

Ecological Field Survey ORG-AR [illegible]

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	32	33	34	35	36	
Native perennial grass	98	83	80	75	50	
Native other grass (if relevant)						
Native forbs and other species (non-grass)		2		10	45	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs	2				5	
Litter			5	15		
Rock		15	15			
Bare ground						
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Non Rem - No	ItU R		
Survey result	11	V		
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	~~Absent~~		Present	
Wetland / Swamp / Waterbody	~~Absent~~		Present	
Waterway	~~Absent~~		Present	
Potential for nectar / pollen	Absent	Scattered	~~Common~~	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	~~Common~~	Abundant
Potential for seeding grass cover	Absent	Scattered	~~Common~~	Abundant
Dense shrub/grass shelter	Absent	~~Scattered~~	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	~~Common~~	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	~~Scattered~~	Common	Abundant
Large rocks (>30cm)	~~Absent~~	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	~~Scattered~~	Common	Abundant
Leaf litter depth	Absent	~~Single layer~~	Multiple layers	Deep layers
Leaf litter coverage	Absent	~~Scattered~~	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	~~Common~~	Abundant
Rock piles	~~Absent~~	Scattered	Common	Abundant
Trees with shedding bark	~~Absent~~	Scattered	Common	Abundant
Soil cracks	~~Absent~~	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	~~Common~~	Abundant
Mistletoe/Epiphytes	Absent	~~Scattered~~	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Termites					
large trees					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Termite mounds, large trees.
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment:	Yes / (No)		Is the vegetation suitable for slashing only?
Suitable – if all 4 questions are yes	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	Timbered
Notes			

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORGANISM FOR QUERY

target zero
zero incidents ▶ zero injuries

SITE IDENTIFICATION			
Site Name:	Boundary Rd turnoff	Date:	10/8/21
Tenure:	PL 196	Assessor(s):	Rose Nicholas

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	(zone 001) 311487
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6957309
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	#RAL 5179		#	
East	#RAL 5181		#	
South	#RAL 5182		#	
West	#RAL 5185		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	(N)	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange		Brown		Red	
	Black	Grey	(Pale)		Dark		Mottled	
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'		'Silty loam'	
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	('Silty clay loam')	'Light clay'		'Light medium clay'	
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)		Scattered				Frequent	
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure		Stream-bank	

Ecological Habitat Survey ORG-ARW-FSM-FOR-0006/7

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: transport (road corridor)				
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance				
Dieback	0%	1-25%	26-75%	>76%	n/a					
Site condition	Very good	Good	Moderate	Poor	Degraded					
Fire scars	Absent	Scattered	Frequent	Time since	Recent	Old	Average Height (m)			
Disturbance notes	Scattered old fence wire / rubbish present									

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	CEST	Rf	H	FOR	WDL	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: CEST-Coastal & estuarine; Rf-Rainforest (including SFVT); H Heath; FOR-Forest; WDL-Woodland; GRL-Grassland; IMP-Improved pasture; LKE-Lake/dam; RIP-Riparian; SHR-Shrubland; SW Swamp/Wetland; DIS-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G		
Avg height (m) of EDL	15				Avg DBH (cm) of EDL		35				
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a		
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent		

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site - records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia humifusa	Scattered	002	311476	6957311	RM_5186
Eragrostis curvula	Low	004	311484	6957312	RM_5187

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	E	Start Easting	(wpt 002) 31464	End Easting	(wpt 003) 31512
		Start Northing	695731	End Northing	5957521

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		13 16	8 10	2 5 4 1	1.5	.03 0.5
Canopy cover (%)		15	35	5	1	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus papuana		50						
Pittosporum arnottianum		6						
Ficus platypoda		1						
[illegible]		1						
Sida rhombifolia								
Ficus pseudomolina								
[illegible]								
Ingrisine glomerata								
[illegible]								
[illegible]								
Fragaria parviflora								
Brachiaria [illegible]								
Solanum diploconum								
[illegible]								
[illegible]								
Carex inversa								
[illegible]								
Cuscuta [illegible]								
Cyperus gracilis								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Sporobolus creber								
Eragrostis pilosoides								
Eragrostis dielsii								
Eragrostis [illegible]								
[illegible]								
Maireana [illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
Sclerolaena [illegible]								
[illegible]								
Portulaca [illegible]								

Ecological Field Survey DRG ARW ITSM FOR 0006/

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	5188	5189	5190	5191	5192	
Native perennial grass	53	79	39	12	57	48.6
Native other grass (if relevant)						
Native forbs and other species (non-grass)	1	5	1	5	2	2.8
Native shrubs (<1m)	25					5
Non-native grass				15	10	5
Non-native forbs and shrubs	10	1		1	1	2.6
Litter	10	10	20	34	10	18.9
Rock						
Bare ground	1	5	30	30	20	17.2
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1a (regrowth)		LC	NC
Survey result			LC	NC
Agree with mapped RE? If no, provide justification from field data	Yes			

2, 3, 5, b'k

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	1	Total length of logs (>10cm)	2.4	No. of logs (>10cm)	3
Per hectare (x 20)	0	Per hectare (x 20)	20	Per hectare (x 20)	248	Per hectare (x 20)	60

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil					

E	Endangered
V	Vulnerable
NT	Near-Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of transect

East face of the transect

South face of the transect

West face of the transect

4

Ecological Field Survey ORG ARW 115M FOR 00067

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	ARW362 pipeline ext	Date:	01/6/21
Tenure:	PL198	Assessor(s):	Rob Andrew

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	wpt (50) 2[illegible]
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	[illegible]
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#ARW_5223		#	
East	#ARW_5223		#	
South	#ARW_5224		#	
West	#ARW_5225		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)

Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)

Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)		
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)		
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**			
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**			
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)					
Erosion	Absent	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

Ecological Field Survey Form ORGANISM FOR GOOGLE

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%		26-75%	>75%	n/a	
Site condition	Very good	Good		Moderate	Poor	Degraded	
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)					
Macrohabitat(s) present	CEST Rf H FOR WDL GRL IMP LKE RIP SHR SW DIS				
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).					
Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	20		**Avg DBH (cm) of EDL**	46	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia stricta	Scattered	019	311592	6957514	KHL_5221
Eragrostis curvula	Scattered	023	311592	6957515	KHL_5226

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; If confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NW	Start Easting	WGS 211609	End Easting	WGS 211574
		Start Northing	6957494	End Northing	6957533

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		19 30	4 7		0.5 1.5	
Canopy cover (%)		3	15		1	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus sopu.rea		50		1			III	
Eucalyptus crebra		1					1	
Angophora floribunda		1					1	
Cassinia arcuata								
Clavis navarre								
Eragrostis leptostachya								
Eragrostis [illegible]								
[illegible]								
Aristida calycina								
[illegible]								
Paspalidium [illegible]								
Microlaena stipoides								
Dichanthium sericeum								
[illegible]								
Themeda triandra								
[illegible]								
[illegible]								
Eragrostis parviflora								
Dichelachne [illegible]								
Eucalyptus [illegible]								
Parthenium [illegible]								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
[illegible]								
[illegible]								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	RM_5027	RM_5026	RM_5025	RM_5024	RM_5023	
Native perennial grass	78	73	76	74	67	73.6
Native other grass (if relevant)						
Native forbs and other species (non-grass)	1		1	1	1	0.8
Native shrubs (<1m)						
Non-native grass	4	10	5	5	2	5.2
Non-native forbs and shrubs	0	2	3		5	2.4
Litter	5	5	5	5	5	5
Rock						
Bare ground	10	10	10	15	20	13
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Regrowth 11.5.4c	-	LC	NC
Survey result	Regrowth 11.5.4c	-	LC	NC
Agree with mapped RE?				
If no, provide justification from field data	It is however very sparse canopy and more towards [illegible]			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Glider - Stick-nest for pic private feature			[illegible] 376161	6757384	South of site (off easement)

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	Yes	No	[illegible] considered nearby veg
Ecologist	Yes	(No)	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 70%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of transect

East face of the transect

South face of the transect

West face of the transect

(7)

Ecological field survey ORR ARW HSM SOR 00067

target zero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	ARW2D Lease	Date:	12 / 8 / 21
Tenure:	PL 1050	Assessor(s):	Rose Mowbray &

DEVELOPMENT TYPE & LOCATION					
Development Type				Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility			Easting (E)	0[illegible] 310[illegible]
☐ Pilot Well + Dam	☐ Dam			Northing (N)	6960[illegible]
☐ Monitoring	☐ Pipeline			Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line			Other description	
☐ Work over	☐ Property (area) wide				

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	#MVL 5326		#PVL 5334	vpl 0534
East	#PVL 5329		#PVL 5335	
South	#PVL 5330		#PVL 5336	
West	#PVL 5328		#PVL 5337	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (Field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	(Loam)	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

Ecological Field Survey ORG-ARW-FSM-FOR-00067

target zero
► zero accidents ► zero injuries

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Land use	(Grazing)	(Forestry)	Cropping	Conservation	Mining	Other:				
Evidence	Clearing	Cultivation	(Regrowth)	(Logging)	Thinning	No disturbance				
Oleback	0%	(1-25%)	26-75%	>76%	n/a					
Site condition	Very good	Good	Moderate	(Poor)	Degraded					
Fire scars	Absent	Scattered	(Frequent)	**Time since**	(Recent)	Old	**Average Height (m)**	/		
Disturbance notes										

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Macrohabitat(s) present	CEST	Rf	H	FOR	(WDL)	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).										
Ecologically dominant layer (EDL)	(T1)	T2	S1	S2	G					
Avg height (m) of EDL	15		**Avg DBH (cm) of EDL**	15						
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	(<10% (very sparse))	n/a					
Functional shrub layer density (<2m)	Dense/closed	(Mid-dense)	Sparse	Very sparse	Absent					

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SSE	Start Easting	[illegible]	End Easting	[illegible]
		Start Northing	[illegible]	End Northing	[illegible]

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		[illegible]			1 3	0.3 0.7
Canopy cover (%)		5			60	0

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
[illegible]		530					530	
[illegible]		17					[illegible]	
[illegible]		214						214
[illegible]		2		1			1	
[illegible]		1						1
Galium aparine								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
Sporobolus [illegible]								

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GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	RH. 5312	RH. 5313	RH. 5314	RH. 5315	RH. 5316	
Native perennial grass	10	50	52	55	10	35.2
Native other grass (if relevant)						
Native forbs and other species (non-grass)	2		3			1
Native shrubs (<1m)	5	5	5	15	20	8
Non-native grass						
Non-native forbs and shrubs						
Litter	20	30	30	10	5	17
Rock						
Bare ground	63	95	10	10	5	36.6
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.7.4	-	LC	NC
Survey result	11.7.4	-	LC	NC
Agree with mapped RE? If no, provide justification from field data	Yes			

5.5.6, 15, 16, 25

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	2	**No. of hollow logs**	1	**Total length of logs (>10cm)**	136	**No. of logs (>10cm)**	5
Per hectare (x 20)	40	**Per hectare (x 20)**	20	**Per hectare (x 20)**	312	**Per hectare (x 20)**	100

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	Special Least Concern Species Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near-Threatened	
SLC	Special Least Concern	Colonial Breeding Species Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	Yes	No	
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / No Yes / No Yes / No Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	Lynwood FCS 19	**Date:**	13 XII 2023
Tenure:	PL 198	**Assessor(s):**	*Thiago Moura*

DEVELOPMENT TYPE & LOCATION									
Development Type				**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**					
☐	Well Pad	☐	Gas Processing Facility	**Easting (E)**					
☐	Pilot Well + Dam	☐	Dam	**Northing (N)**					
☐	Monitoring	☐	Pipeline	**Datum**	☐GDA94	☐MGA	Zone	☐55	☑56
☐	Roads & Tracks	☐	Seismic Line		Solar farm				
☐	Work over	☐	Property (area) wide						

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	230			
East	231			
South	232			
West	233			

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	☐Downs – open, rolling, ashy, pebbly	☐Alluvial plain or flat, flood plain	☐Inland clay pan, salt flat, salt pan	☐Coastal tidal flat or salt flat	☑Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	☐Slope or hill not specified	☐Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	☐Coastal rocky headland	☐Top, crest of mountain or ridge	☐Jump-up, mesa, tableland, plateau
Dunes	☐Fossil coastal dune, high dune		☐Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		☐Inland dune, inland sand hill
Streams	☐Permanent lake, river, stream, watercourse, levees and/or their banks		☐Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		☐Inland channel country, stream distributary system, intermittently
Water	☐Freshwater lake, lagoon, spring	☐Freshwater swamp, marsh, soak, seepage area		☐Gligai, melon hole, sinkhole	☐Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	☐Level (<1%)	☐Gently sloping (1-4%)	☐Moderately Sloping (5-10%)	☐Strongly sloping (11-24%)				
	☐Moderately steep (25-38%)	☐Steep (39-55%)	☐Very steep (56-100%)	☐Slope > 100% (45°)				
Aspect	☐N	☑S	☐E	☐W	☐NE	☐NW	☐SE	☐SW	☐Nil
Soil colour	☐White	☐Yellow	☐Orange	☑Brown	☐Red			
	☐Black	☐Grey	☐Pale	☑Dark	☐Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	☐'Sandy'	☐'Loamy sand'	☐'Clayey sand'	☐'Sandy loam'	☐**'Loam'**	☐**'Silty loam'**		
	☐**'Sandy clay Loam'**	☑**'Clay loam'**	☐**'Clay loam sandy'**	☐**'Silty clay loam'**	☐**'Light clay'**	☐**'Light medium clay'**		
	☐**'Medium clay'**	☐**'Medium heavy clay'**	☐**'Heavy clay'**	☐(Saline mud)				
Erosion	☑Absent	☐Scattered	☐Frequent					
Erosion Type	☐Tunnelling	☐Sheet	☐Rill	☐Gully	☐Mass failure	☐Streambank		

	DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	☑Grazing	☑Forestry	☐Cropping	☐Conservation	☐Mining	☐Other:		
Evidence	☑Clearing	☐Cultivation	☑Regrowth	☑Logging	☐Thinning	☐No Disturbance		
Dieback	☐0%	☑1-25%	☐26-75%	☐26-27%	☐>76%	☐NA		
Site condition	☐Very Good	☐Good	☑Moderate	☐Poor	☐Degraded			
Fire Scars	☑Absent	☐Scattered	☐Frequent	**Time Since**	☐Recent	☐Old	**Average Height (m)**	
Disturbance								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)					
Macrohabitat(s) present	☐CEST ☐Rf ☐H ☐FOR ☑WDL ☐GRL ☐IMP ☐LKE ☐RIP ☐SHR ☐SW ☐DIS				
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).					
Ecologically dominant layer (EDL)	☑T1	☐T2	☐S1	☐S2	☐G
Avg height (m) of EDL	12		**Avg DBH (cm) of EDL**	78	
Canopy cover (%) of EDL	☐>70% (dense/closed)	☐30-70% (mid-dense)	☑10-30% (sparse)	☐<10% (very sparse)	☐N/A
Functional shrub layer density (<2m)	☐Dense/closed	☐Mid-dense	☐Sparse	☑Very sparse	☐Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	☐Found on Site – records below	☑Not Found On Site
Weed infestations	☑Found on Site – records below	☐Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Grevillea lemonteyi					

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start Compass bearing	☐N ☑S ☐E ☐W ☐NE ☐NW ☐SE ☐SW	Start Easting	360 311588	End Easting	~~367~~ 360 311586
		Start Northing	6957845	End Northing	6957794

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)	/	9 – 15	4 – 7		1 – 2	0.1 – 1
Canopy cover (%)	/	10	10		5	10

Common name / Collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or 5m x 2m plot for dense cover in S1 and S2) – Denote type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		Total						
Eucalyptus populnea		19		☒L	☒☒L			
Eucalyptus decorticans		15		☒☐	☒L			
Allocasuarina luehmannii		22			☒☒		☒☒L	
Callitris glaucophylla		20			☒☒☒L		☐	
Aristida ramosa								
Cymbopogon refractus								
Panicum queenslandicum								
Goodenia paradoxa								
Calotis dentex								
Brunonia australis								
Chrysocephalum apiculatum								
Wahlenbergia capillaris								
Glandularia aristigera								

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Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	234	235	236	237	238	
Native perennial grass	30	20	10	30	70	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	20	20				
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	10	30	20	30	20	
Rock						
Bare ground	40	30	70	40	10	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	NA	LC	LC
Survey result	11.7.4	NA	LC	LC
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	1	No. of hollow logs	/	Total length of logs (>10cm)	1	No. of logs (>10cm)	1
Per hectare (x 20)	40	Per hectare (x 20)	/	Per hectare (x 20)	60	Per hectare (x 20)	20

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	☑Absent		☐Present	
Wetland / Swamp / Waterbody	☑Absent		☐Present	
Waterway	☑Absent		☐Present	
Potential for nectar / pollen	☐Absent	☐Scattered	☑Common	☐Abundant
Potential for fleshy fruiting plants	☐Absent	☐Scattered	☑Common	☐Abundant
Potential for seeding grass cover	☐Absent	☐Scattered	☑Common	☐Abundant
Dense shrub/grass shelter	☐Absent	☑Scattered	☐Common	☐Abundant
Large Eucalypts (>30cm DBH)	☐Absent	☐Scattered	☑Common	☐Abundant
Large Non-Eucalypts (>20cm DBH)	☐Absent	☑Scattered	☐Common	☐Abundant
Large rocks (>30cm)	☑Absent	☐Scattered	☐Common	☐Abundant
Small rocks (10-30cm)	☑Absent	☐Scattered	☐Common	☐Abundant
Leaf litter depth	☐Absent	☑Single layer	☐Multiple layers	☐Deep layers
Leaf litter coverage	☐Absent	☑Scattered	☐Common	☐Abundant
Termite mounds (>50cm)	☐Absent	☑Scattered	☐Common	☐Abundant
Rock piles	☑Absent	☐Scattered	☑Common	☐Abundant
Trees with shedding bark	☐Absent	☐Scattered	☑Common	☐Abundant
Soil cracks	☑Absent	☐Scattered	☐Common	☐Abundant
Koala feed trees	☐Absent	☐Scattered	☑Common	☐Abundant
Mistletoe/Epiphytes	☐Absent	☑Scattered	☐Common	☐Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	NA	No. of trees with hollows (>30cm)	NA

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	☑Yes	☐No	
Ecologist	☐Yes	☑No	
Species Management Plan	☐Yes	☑No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	☐Yes	☑No	Is the vegetation suitable for slashing only?
	☑Yes	☐No	Is the slope < 5%?
	☑Yes	☐No	Is the clay content > 20%?
	☑Yes	☐No	Are gilgais absent?
Suitable for minimal disturbance?	☐Yes	☑No	
Notes			

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

SITE IDENTIFICATION			
Site Name:	Lynwood FCS 20	Date:	13 XII 2023
Tenure:	PL 990	Assessor(s):	*Thiago Moura*

DEVELOPMENT TYPE & LOCATION									
Development Type				**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**					
☐	Well Pad	☐	Gas Processing Facility	Easting (E)	311759				
☐	Pilot Well + Dam	☐	Dam	Northing (N)	6957661				
☐	Monitoring	☐	Pipeline	Datum	☐GDA94	☐MGA	Zone	☐55	☒56
☐	Roads & Tracks	☐	Seismic Line						
☐	Work over	☐	Property (area) wide						

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	239			
East	240			
South	241			
West	242			

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	☐Downs – open, rolling, ashy, pebbly	☐Alluvial plain or flat, flood plain	☐Inland clay pan, salt flat, salt pan	☐Coastal tidal flat or salt flat	☒Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	☐Slope or hill not specified	☐Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	☐Coastal rocky headland	☐Top, crest of mountain or ridge	☐Jump-up, mesa, tableland, plateau
Dunes	☐Fossil coastal dune, high dune		☐Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		☐Inland dune, inland sand hill
Streams	☐Permanent lake, river, stream, watercourse, levees and/or their banks		☐Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		☐Inland channel country, stream distributary system, intermittently
Water	☐Freshwater lake, lagoon, spring	☐Freshwater swamp, marsh, soak, seepage area		☐Gilgai, melon hole, sinkhole	☐Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	☐Level (<1%)	☐Gently sloping (1-4%)	☐Moderately Sloping (5-10%)	☐Strongly sloping (11-24%)					
	☐Moderately steep (25-38%)	☐Steep (39-55%)	☐Very steep (56-100%)	☐Slope > 100% (45°)					
Aspect	☐N	☒S	☐E	☐W	☐NE	☐NW	☐SE	☐WE	☐Nil
Soil colour	☐White	☐Yellow	☐Orange	☒Brown	☐Red				
	☐Black	☐Grey	☐Pale	☒Dark	☐Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	☐'Sandy'	☐'Loamy sand'	☐'Clayey sand'	☐'Sandy loam'	☐'Loam'	☐'Silty loam'			
	☐'Sandy clay Loam'	☒'Clay loam'	☐'Clay loam sandy'	☐'Silty clay loam'	☐'Light clay'	☐'Light medium clay'			
	☐'Medium clay'	☐'Medium heavy clay'	☐'Heavy clay'	☐(Saline mud)					
Erosion	☒Absent		☐Scattered		☐Frequent				
Erosion Type	☐Tunnelling	☐Sheet	☐Rill	☐Gully	☐Mass failure	☐Streambank			

Ecological Field Survey

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	☐Grazing	☑Forestry	☐Cropping	☐Conservation	☐Mining	☐Other:		
Evidence	☑Clearing	☐Cultivation	☑Regrowth	☑Logging	☐Thinning	☐No Disturbance		
Dieback	☐0%	☑1-25%	☐26-75%	☐26-27%	☐>76%	☐NA		
Site condition	☐Very Good	☐Good	☑Moderate	☐Poor	☐Degraded			
Fire Scars	☑Absent	☐Scattered	☐Frequent	**Time Since**	☐Recent	☐Old	**Average Height (m)**	
Disturbance								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)					
Macrohabitat(s) present	☐CEST ☐Rf ☐H ☐FOR ☑WDL ☐GRL ☑IMP ☐LKE ☐RIP ☐SHR ☐SW ☐DIS				
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).					
Ecologically dominant layer (EDL)	☑T1	☐T2	☐S1	☐S2	☐G
Avg height (m) of EDL	15		**Avg DBH (cm) of EDL**	18	
Canopy cover (%) of EDL	☐>70% (dense/closed)	☐30-70% (mid-dense)	☑10-30% (sparse)	☐<10% (very sparse)	☐N/A
Functional shrub layer density (<2m)	☐Dense/closed	☐Mid-dense	☐Sparse	☑Very sparse	☐Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	☐Found on Site – records below	☑Not Found On Site
Weed infestations	☑Found on Site – records below	☐Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey DRG-ARW-HSM-FOR-00067

targetzero

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start Compass bearing	5		Start Easting	56J 311749			End Easting	311764				
			Start Northing	6957690			End Northing	6957639				
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)	20	25	10	17	4	8			1	2	0.1	1.0
Canopy cover (%)	5		20		10				5		5	

Common name / Collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or 5m x 2m plot for dense cover in S1 and S2) – Denote type employed					
NB: Record ground cover species within 50m x 10m transect		Total	E	T1	T2	T3	S1	S2
Eucalyptus crebra		25	1	4				
Eucalyptus populnea		27			6			
Callitris glaucophylla		16			5		1	
Allocasuarina luehmannii		16		1	1		1	
Aristida ramosa								
Cymbopogon refractus								
Bothriochloa decipiens	australis							
Gompholobium glaucoides								
Glycine clandestina								
Geijera parviflora								
Panicum queenslandicum								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

Ecological Field Survey

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	243	244	245	246	247	
Native perennial grass	60		30	80	30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10		10		10	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	20	10	20	20	50	
Rock						
Bare ground	10	90	40		10	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	NA	LC	LC
Survey result	11.7.4	NA	LC	LC
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	/	No. of hollow logs	/	Total length of logs (>10cm)	/	No. of logs (>10cm)	/
Per hectare (x 20)	/	Per hectare (x 20)	/	Per hectare (x 20)	/	Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	☑Absent		☐Present	
Wetland / Swamp / Waterbody	☑Absent		☐Present	
Waterway	☑Absent		☐Present	
Potential for nectar / pollen	☐Absent	☐Scattered	☑Common	☐Abundant
Potential for fleshy fruiting plants	☐Absent	☐Scattered	☑Common	☐Abundant
Potential for seeding grass cover	☐Absent	☐Scattered	☑Common	☐Abundant
Dense shrub/grass shelter	☐Absent	☑Scattered	☐Common	☐Abundant
Large Eucalypts (>30cm DBH)	☐Absent	☐Scattered	☑Common	☐Abundant
Large Non-Eucalypts (>20cm DBH)	☐Absent	☐Scattered	☑Common	☐Abundant
Large rocks (>30cm)	☑Absent	☐Scattered	☐Common	☐Abundant
Small rocks (10-30cm)	☑Absent	☐Scattered	☐Common	☐Abundant
Leaf litter depth	☐Absent	☑Single layer	☐Multiple layers	☐Deep layers
Leaf litter coverage	☐Absent	☑Scattered	☐Common	☐Abundant
Termite mounds (>50cm)	☐Absent	☑Scattered	☐Common	☐Abundant
Rock piles	☑Absent	☐Scattered	☐Common	☐Abundant
Trees with shedding bark	☐Absent	☐Scattered	☑Common	☐Abundant
Soil cracks	☐Absent	☐Scattered	☑Common	☐Abundant
Koala feed trees	☐Absent	☐Scattered	☐Common	☑Abundant
Mistletoe/Epiphytes	☐Absent	☑Scattered	☐Common	☐Abundant

Ecological Field Survey

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	NA	No. of trees with hollows (>30cm)	NA

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	☑Yes	☐No	
Ecologist	☐Yes	☑No	
Species Management Plan	☐Yes	☑No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	☐Yes	☑No	Is the vegetation suitable for slashing only?
	☑Yes	☐No	Is the slope < 5%?
	☑Yes	☐No	Is the clay content > 20%?
	☑Yes	☐No	Are gilgais absent?
Suitable for minimal disturbance?	☐Yes	☑No	
Notes			

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	BRP1-01	**Date:**	04 Mar 2024
Tenure:	PL198	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	311051
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6957127
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 03		#	
East	# 04		#	
South	# 05		#	
West	# 06		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**			
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**			
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)					
Erosion		Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	High level of disturbance on vegetation											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1	T2	S1	S2	G							
Avg height (m) of EDL	0.5	**Avg DBH (cm) of EDL**	NA									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	Low				7

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	S	Start Easting	311064			End Easting	311032					
		Start Northing	6957146			End Northing	6957107					
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)			2	4					0.5	1	0.1	0.5
Canopy cover (%)			5						10			

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus populnea		2		2				
Eucalyptus creba		2					2	
Pittosporum angustifolium		1		1				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Cheilanathes sieberi								
Calotis dentex								
Brunoniella australis								
Opuntia tomentosa								
Chrysocephalum apiculatum								
Wahlenbergia capilaris								
Cyperus eragrotris								
Gladularia aristigera								
Aristilda ramosa								
Erogratis elongata								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	12	11	10	9	8	
Native perennial grass	60	20	40	40	30	
Native other grass (if relevant)		10	10			
Native forbs and other species (non-grass)				10	10	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	10	10	20	10	20	
Rock						
Bare ground	20	60	30	40	40	
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	Cleared	NA	NA	NA
Survey result		NA	NA	NA
Agree with mapped RE? If **no**, provide justification from field data	Yes.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	0	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered ✓	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered ✓	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent ✓	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent ✓	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent ✓	Scattered	Common	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent ✓	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent ✓	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common ✓	Abundant
Trees with shedding bark	Absent	Scattered ✓	Common	Abundant
Soil cracks	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered ✓	Common	Abundant
Mistletoe/Epiphytes	Absent ✓	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	NA	**No. of trees with hollows (>30cm)**	NA

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Log	Reptiles				

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation or soil profile disturbance
Ecologist	Yes	No ✓	
Species Management Plan	Yes	No ✓	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	✓ Yes / No Yes / No ✓ Yes / No ✓ ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes ✓	No	
Notes			

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	BRP1-02	**Date:**	04 Mar 2024
Tenure:	PL198	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	311189
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6957106
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 13		#	
East	# 14		#	
South	# 15		#	
West	# 16		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain ✓
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	Level (<1%) ✓	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	N	S	E ✓	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale	Dark ✓	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**			
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’** ✓	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**			
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)					
Erosion	Absent ✓	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Land use	Grazing ✓	Forestry ✓	Cropping	Conservation	Mining	Other:					
Evidence	Clearing ✓	Cultivation	Regrowth ✓	Logging	Thinning	No disturbance					
Dieback	0%	1-25% ✓	26-75%	>76%	n/a						
Site condition	Very good	Good	Moderate ✓	Poor	Degraded						
Fire scars	Absent ✓	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**				
Disturbance notes	Disturbed area for grazing										

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ✓	**GRL**	**IMP** ✓	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1 ✓	T2	S1	S2	G							
Avg height (m) of EDL	10			**Avg DBH (cm) of EDL**	17							
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% ✓ (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse ✓	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below ✓	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	Low				17

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	E		Start Easting	311174			End Easting	311205					
			Start Northing	6957085			End Northing	6957123					
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			9	12	2	4			1	2	0.1	0.5	
Canopy cover (%)			5		5				5		10		
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed										
NB: Record ground cover species within 50m x 10m transect			E		T1		T2		T3		S1		S2
		TOTALS											
Eucalyptus crebra		7			5		2						
Eucalyotus populnea		4			2						2		
Allocasuarina luehmanni		2									2		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Juncus subsecundus								
Lomandra longifolia								
Panicum queenslandeicum								
Wahlenbergia capilaris								
Glandularia aristigera								
Gomphrema celosioides								
Opuntia tomentosa								
Aristida ramosa								
Eragrostis elongata								
Hypochaeris albiflora								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	22	23	24	25	26	
Native perennial grass	10					
Native other grass (if relevant)		10	10	20	10	
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	60	30	20	10	20	
Rock						
Bare ground	10	10	10	40	40	
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	regrowth 11.5.1	NA	LC	NCAP
Survey result	Non-remnant	NA	NA	NA
Agree with mapped RE? If **no**, provide justification from field data	Area heavily thinned or logged with significant disturbance vegetation. Woody strata has floristics characteristic to 11.5.1a, but it fails to meet the structural characteristic of remnant vegetation			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	0	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common ✓	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common ✓	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent ✓	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered ✓	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered ✓	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent ✓	Scattered	Common	Abundant
Soil cracks	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	NA	No. of trees with hollows (>30cm)	NA

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
NA	NA				

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation or soil profile disturbance
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Grey Snake
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No ✓ Yes / No ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No ✓	
Notes			

Grey snake possible habitat is mapped approx 800m. Woody vegetation surround is 11.5.1 with an artificial body water present approx 300m.

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	BRP1-03	**Date:**	04 Mar 2024
Tenure:	PL198	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	311308
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6957093
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 25		#	
East	# 26		#	
South	# 27		#	
West	# 28		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain ✓
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	Level (<1%) ✓	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	N	S	E	W	NE ✓	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale	Dark ✓	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**			
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’** ✓	**‘Light clay’**	**‘Light medium clay’**			
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)					
Erosion	Absent ✓	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing ✓	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate ✓	Poor	Degraded							
Fire scars	Absent ✓	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ✓	**GRL**	**IMP** ✓	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1 ✓	T2	S1	S2	G							
Avg height (m) of EDL	10			**Avg DBH (cm) of EDL**	17							
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% ✓ (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse ✓	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below ✓	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	Low				29

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	NE	Start Easting	311286			End Easting	311354						
		Start Northing	6957080			End Northing	6957110						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			8	12	4	7			1	2	0.1	1	
Canopy cover (%)			5		5				10		10		
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed										
NB: Record ground cover species within 50m x 10m transect			E		T1		T2		T3		S1		S2
		TOTALS											
Eucalyptus populnea		16			9		2				5		
Allocasuarina luehmanni		8					3				5		
Callitris glaucophylla		3					2				1		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Wahlenbergia capilaris								
Gomphrema celosioides								
Sida cordifolia								
Opuntia tomentosa								
Goodenia paradoxa								
Glandularia aristigera								
Eragrostis elongata								
Digitaria eriantha								
Calotis dentex								
Brunonelia australis								
Aristida ramosa								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	30	31	32	33	34	
Native perennial grass	20	10	20	10	10	
Native other grass (if relevant)	10	20	20	10	10	
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	10	40	20	20	10	
Rock						
Bare ground	60	30	40	60	80	
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	Regrowth 11.5.1	NA	LC	NCAP
Survey result	Non-remnant	NA	NA	NA
Agree with mapped RE? If **no**, provide justification from field data	Area heavily thinned or logged with significant disturbance vegetation. Woody strata has floristics characteristic to 11.5.1a, but it fails to meet the structural characteristic of remnant vegetation			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	1	**Total length of logs (>10cm)**	3	**No. of logs (>10cm)**	2
Per hectare (x 20)	0	**Per hectare (x 20)**	20	**Per hectare (x 20)**	60	**Per hectare (x 20)**	40

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common ✓	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common ✓	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered ✓	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered ✓	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered ✓	Common	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered ✓	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common ✓	Abundant
Soil cracks	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	NA	No. of trees with hollows (>30cm)	NA`

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation or soil profile disturbance
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Grey Snake
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓Yes / No ✓Yes / No ✓Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No ✓	
Notes			

Grey snake possible habitat is mapped approx 800m. Woody vegetation surround is 11.5.1 with an artificial body water present approx 100m.

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	BRP1-08	**Date:**	05 Mar 2024
Tenure:	PL1040	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	310620
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6957860
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 101		#	
East	# 102		#	
South	# 103		#	
West	# 104		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain ✓
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%) ✓	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW ✓	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale	Dark ✓	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’** ✓	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent ✓	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging ✓	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good ✓	Moderate	Poor	Degraded							
Fire scars	Absent ✓	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR** ✓	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1 ✓	T2	S1	S2	G							
Avg height (m) of EDL	10			**Avg DBH (cm) of EDL**	17							
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below ✓	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	Low				105
Opuntia stricta	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	Northwest		Start Easting	310635			End Easting	310612					
			Start Northing	6957834			End Northing	6957918					
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)	17	20	8	15	5	7			1	2	0.1	0.5	
Canopy cover (%)	5		10		5				10		10		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia leiocalyx		17		4	7		6	
Eucalyptus crebra		7	4	1	2			
Callitris glaucophylla		7		4	3			
Angophora leicarpa		1	1					
Corymbia clarksoniana		4		4				
Alphitonia excelsa		3					3	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Hypochaeris albiflora								
Sida cordifolia								
Cheilanthes sieberi								
Oxalis perennans								
Calotis cuneifolia								
Goodenia paradoxa								
Evolvulus alsinoides								
Brunonelia australis								
Opuntia tomentosa								
Opuntia stricta								
Gahnia aspera								
Glandularia aristigera								
Aristida ramosa								
Cymbopogon refractus								
Eragrostis elongata								
Maireana decalvans								
Lysiana subfalcata								
Dendrophthoe glabrescens								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	110	111	112	113	114	
Native perennial grass	30	30	10	10	20	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	20				
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	40	40	60	60	40	
Rock						
Bare ground	20	10	30	30	40	
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.7.4	NA	LC	NCAP
Survey result	11.7.4	NA	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	Yes.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	0	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant ✓
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant ✓
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered ✓	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common ✓	Abundant
Large rocks (>30cm)	Absent	Scattered	Common ✓	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common ✓	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant ✓
Soil cracks	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant ✓
Mistletoe/Epiphytes	Absent	Scattered	Common ✓	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	NA	**No. of trees with hollows (>30cm)**	NA

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
NA					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Core habitat for threatened fauna
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No ✓ Yes / No ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No ✓	
Notes			

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	BRP1-09	**Date:**	05 Mar 2024
Tenure:	PL1040	**Assessor(s):**	Thiago Moura

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DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	310209
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6958483
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#114		#	
East	#115		#	
South	#116		#	
West	#117		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain ✓
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	Level (<1%)	Gently sloping (1-4%) ✓	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	N	S	E	W ✓	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**			
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’** ✓	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**			
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)					
Erosion	Absent ✓	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging ✓	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good ✓	Moderate	Poor	Degraded							
Fire scars	Absent ✓	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR** ✓	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1 ✓	T2	S1	S2	G							
Avg height (m) of EDL	15			**Avg DBH (cm) of EDL**	23							
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% ✓ (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse ✓	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below	Not Found On Site ✓

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	West		Start Easting	310233			End Easting	310186					
			Start Northing	6958467			End Northing	6958478					
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			13	17	7	10			1	2	0.1	0.5	
Canopy cover (%)			10		10				10		5		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra		12		8	4			
Acacia leiocalyx		19			8		11	
Callitris glaucophylla		18		4	7		7	
Allocasuarina luehmanni		10		1	7		2	
Angophora leiocarpa		8			8			

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Digitaria eriantha								
Dichanthium sericeum								
Lysimachia arvensis								
Goodenia paradoxa								
Oxalis perennans								
Sida cordifolia								
Dendrophthoe glabrescens								
Evolvulus alsinoides								
Cyperus eragrostis								
Gahnia aspera								
Eragrostis elongata								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	118	119	120	121	122	
Native perennial grass	40	20	60	20	30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	10	20			
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	40	40	10	80		
Rock						
Bare ground	10	30	10		60	
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	1.7.4	NA	LC	NCAP
Survey result	11.7.4	NA	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	Yes.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	0	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant ✓
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant ✓
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant ✓
Dense shrub/grass shelter	Absent	Scattered ✓	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common ✓	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common ✓	Abundant
Soil cracks	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant ✓
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	NA	**No. of trees with hollows (>30cm)**	na

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
NA					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation or soil profile disturbance
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Threatend speices core habitat
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓Yes / No ✓Yes / No ✓Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No ✓	
Notes			

Presence of Koala feed trees. Also, trees of habitat for Calyptorhnchus lathami and Nyctophilus corbeni.

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	BRP1-13	**Date:**	06 Mar 2024
Tenure:	PL198	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	310290
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6963390
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#164		#	
East	#165		#	
South	# 166		#	
West	# 167		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain ✓
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%) ✓	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE ✓	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale ✓	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’** ✓	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent ✓	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate ✓	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent ✓	**Time since**	Recent	Old ✓	**Average Height (m)**	4				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ✓	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1 ✓	T2	S1	S2	G							
Avg height (m) of EDL	13	**Avg DBH (cm) of EDL**	23									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% ✓ (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse ✓	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below	Not Found On Site ✓

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	Southeast	Start Easting	311997			End Easting	310315						
		Start Northing	6961692			End Northing	6963378						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			15	19	6	12			1	2	0.1	0.5	
Canopy cover (%)			20		10				10		5		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra		14		10	4			
Callitris glaucophylla		19		10	9			
Allocasuarina luehmanni		2		1	1			
Acacia leiocalyx		16			9		7	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Aristida ramosa								
Lomandra longifolia								
Cymbopogon refractus								
Dendrophthoe glabrescens								
Glandularia aristigera								
Brunonelia australis								
Aristida caput-medisae								
Eragrostis elongata								
Hypochaeris albiflora								
Goodenia paradoxa								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	168	169	170	171	172	
Native perennial grass	20	40	20	30	40	
Native other grass (if relevant)						
Native forbs and other species (non-grass)			10		20	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	10	10	60	30	20	
Rock						
Bare ground	70	50	10	40	20	
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1	NA	LC	NCAP
Survey result	11.5.1	NA	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	Yes,			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	0	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant ✓
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant ✓
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered ✓	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common ✓	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common ✓	Abundant
Soil cracks	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant ✓
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	NA	**No. of trees with hollows (>30cm)**	NA

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nest - incative	Birds				
Hollow	Small mammal / reptiles				
Logs	Reptiles				

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation
Ecologist	Yes	No ✓	
Species Management Plan	Yes	No ✓	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No ✓ Yes / No ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No ✓	
Notes			

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Lyn-Tip01	**Date:**	2 April 2024
Tenure:	PL198	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	310673
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6968317
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 1		#	
East	# 2		#	
South	# 3		#	
West	# 4		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain ✓	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%) ✓	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E ✓	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale	Dark ✓	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’** ✓	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent ✓	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing ✓	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing ✓	Cultivation	Regrowth ✓	Logging	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good ✓	Moderate	Poor	Degraded							
Fire scars	Absent ✓	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR** ✓	**WDL** ✓	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1 ✓	T2	S1	S2	G							
Avg height (m) of EDL	7			**Avg DBH (cm) of EDL**	14							
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense) ✓	10-30% (sparse)	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse ✓	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	East		Start Easting	310659			End Easting	310690					
			Start Northing	698335			End Northing	6968298					
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			4	10	2	3			1	2	0.1	1	
Canopy cover (%)			10		20				5		5		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra		8		4	4			
Callitris glaucophylla		17		5	12			
Acacia conferta		11					11	
Eucalyptus decorticans		10		2	8			
Allocasuarina luehmannii		7		7				
Angophora leiocarpa		1		1				
Fimbristylis dichotoma								
Goodenia paradoxa								
Cyperus eragrostis								
Portulaca pilosa								
Hypochaeris albiflora								
Brunonelia australis								
Aristida caput-medisae								
Lysiana subfalcata								
Panicum queenslandeicum								
Cheilanthes sieberi subsp. sieberi								
Cymbopogon refractus								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	5	6	7	8	9	
Native perennial grass	20	20	30	40	30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	20	10	10	10	10	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs					20	
Litter	30	40	50	30	50	
Rock						
Bare ground	30	30	10			
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1	NA	LC	NCAP
Survey result	11.5.1	NA	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	Yes.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	2	**No. of logs (>10cm)**	1
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	40	**Per hectare (x 20)**	20

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common ✓	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common ✓	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered ✓	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common ✓	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common ✓	Abundant
Soil cracks	Absent	Scattered ✓	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant ✓
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	NA	**No. of trees with hollows (>30cm)**	NA

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Logs	Small mammals / reptiles				
Hollows	Small mammals / reptiles				

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No ✓ Yes / No ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No ✓	
Notes			

Potential habitat for Koala due the feed tree present.

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Lyn-Tip02	**Date:**	2 April 2024
Tenure:	PL198	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	310625
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	698304
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 11		#	
East	# 12		#	
South	# 13		#	
West	# 14		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain ✓	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE ✓	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale	Dark ✓	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’** ✓	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent ✓	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing ✓	Forestry ✓	Cropping	Conservation ✓	Mining	Other: Firebreack						
Evidence	Clearing ✓	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0% ✓	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor ✓	Degraded							
Fire scars	Absent ✓	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Firebreack zone											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR** ✓	**WDL** ✓	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS** ✓
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G ✓			
Avg height (m) of EDL	0.5				**Avg DBH (cm) of EDL**		NA					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense) ✓		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse ✓		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below ✓	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Melines repens	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	Southwest		Start Easting	310628			End Easting	310607				
			Start Northing	6968231			End Northing	6968280				
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)			1	2							0.1	1
Canopy cover (%)			>5								10	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Callitris glaucophylla		2		2				
Eucalyptus crebra		1		1				
Acacia conferta		5						5
Aristida caput-medisae								
Panicum queenslandeicum								
Glandularia aristigera								
Chrysocephalum apiculatum								
Gahnia aspera								
Portulaca pilosa								
Gomphrema celosioides								
Eragrostis elongata								
Wahlenbergia capillaris								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	15	16	17	18	19	
Native perennial grass	70	60	70	20	20	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs					20	
Litter	10	20	10	20	10	
Rock						
Bare ground	20	20	10	60	50	
Cryptogams			10			
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	Cleared	NA	NA	NA
Survey result	Cleared	NA	NA	Na
Agree with mapped RE? If **no**, provide justification from field data	yes.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	0	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common ✓	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common ✓	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent ✓	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common ✓	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent ✓	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent ✓	Scattered	Common	Abundant
Soil cracks	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent ✓	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	NA	**No. of trees with hollows (>30cm)**	NA

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
NA					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	
Ecologist	Yes	No ✓	
Species Management Plan	Yes	No ✓	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	✓ Yes / No ✓ Yes / No ✓ Yes / No ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	✓Yes	No	
Notes			

Area was cleared for firebreack purporses.

North face of transect

East face of the transect

South face of the transect

West face of the transect

TR 2

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris 1 - TR2	Date:	22.07.2024
Tenure:	PL 1040	Assessor(s):	NAZIM UDDIN

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	310488
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6965154
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7065		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	(NE)	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:					
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance					
Dieback	0%	1-25%	26-75%	>76%	n/a						
Site condition	Very good	Good	Moderate	Poor	Degraded						
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**				
Disturbance notes											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	16		**Avg DBH (cm) of EDL**	30	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey CHG-ARW-HSM-FOR-00037 targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NE	**Start Easting**	310462	**End Easting**	310515
		Start Northing	6965154	**End Northing**	6065160

Stratum	**E**	**T1**	**T2**	**T3**	**S1**	**S2/Seedlings**
Height range (m)	|	14 | 18	8 | 12	4 | 8	1 | 2	0.1 | 0.9
Canopy cover (%)		25	5	10	5	5

Common name/collection name	**Species name**	**Sample (Field No.)**	**Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed**					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						
E. crebra		13		5	3	2		
E. woollsiana		1		1				
Allocasuarina	luehmannii	82			12	17	32	21
							2	3
Acacia leiocalyx		5						
Fimbristylis dichotoma								
Panicum spp.								
Entolasia stricta								
Chrysocephalum apiculatum								
Melinis repens								
Aristida caput.medusae								

Ecological Field Survey [illegible]

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) = Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7060	→	→	→	→	
Native perennial grass	15	10	20	15	10	
Native other grass (if relevant)	5	5				
Native forbs and other species (non-grass)					5	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	60	70	60	60	50	
Rock						
Bare ground	20	15	20	25	35	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.5.1	NA	LC	NC
Survey result	11.5.1	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	17	No. of logs (>10cm)	7
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	340	Per hectare (x 20)	140

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	Yes / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

(TR1)

Ecological Field Survey OSG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Tetris1-TR3	Date:	23.07.2024
Tenure:	PL 198	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	311986
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6965284
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	#7100		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	(SW)	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	('Sandy clay loam')	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	13					**Avg DBH (cm) of EDL**			22			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SW	Start Easting	311986			End Easting	311940				
		Start Northing	6965284			End Northing	6965274				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		10	14	6	10	2	6	1	2	0'1	0'9
Canopy cover (%)		20		15		5		5		5	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. crebra		9		9				
Melaleuca spp.		3			3			
Casuarina luehmannii		59		6	31	10	21	11
Callitris glaucophylla		22		5	6	5	3	2
Acacia leiocalyx		2					2	
Grevillea compt-medusae								
Pahiculum deanei ssp.								
Cheilanthes sieberi								
Fimbristylis dichotoma								
Rhagodia aspera								
Lomandra spp.								
Chrysocephalum apiculatum								

S2

Ecological Field Survey [illegible]

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7095	→	→	→	→	
Native perennial grass	20	25	15	25	20	
Native other grass (if relevant)	5	5				
Native forbs and other species (non-grass)	10		5		5	
Native shrubs (<1m)					10	
Non-native grass						
Non-native forbs and shrubs						
Litter	50	40	50	40	45	
Rock						
Bare ground	15	30	30	35	20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.5.1	NA	LC	NC
Survey result	11.5.1	11	11	11
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	Y	Total length of logs (>10cm)	10	No. of logs (>10cm)	4
Per hectare (x 20)	20	Per hectare (x 20)	X	Per hectare (x 20)	200	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR 2

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris 1 - TR 4	Date:	23.07.2024
Tenure:	PL 198	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	313096
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6965118
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7124		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ~~ESU or 100m x 100m~~ area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	('Sandy clay loam')	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	10				**Avg DBH (cm) of EDL**		20					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)							
Transect Start compass bearing	S	Start Easting	313023	End Easting	313092		
		Start Northing	6065130	End Northing	6065004		
Stratum	E	T1	T2	T3	S1	S2/Seedlings	
Height range (m)		8 | 12	4 | 8	2 | 4	1 | 2	0·1	0·5
Canopy cover (%)		20	10	5	5	2	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina luehmannii				18	12	10	15	7
Callitris glaucophylla				17	5	6	9	13
Chrysopogon sieberi								
Aristida caput-medusae								
Eulalia aspera								
Dianella caerulea								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7119	→				
Native perennial grass	10	10	20	15	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	5	10	10	5	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	60	55	40	35	35	
Rock						
Bare ground	20	30	30	40	50	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.5.1	NA	LC	NC
Survey result	11.5.1	11	11	U
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	L	No. of logs (>10cm)	2
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	120	Per hectare (x 20)	40

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

(TR5)

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Tetris1-TR7	Date:	23.07.2024
Tenure:	PL1040	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	309208
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6965559
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7164		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	('Sandy clay loam')	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	14		**Avg DBH (cm) of EDL**	25	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SE	Start Easting	309199	End Easting	309211
		Start Northing	6965588	End Northing	6965532

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)	1	10 | 16	6 | 10	2 | 5	1 | 2	0.1 | 0.5
Canopy cover (%)		20	10	5	2	5

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. willisiana		10		8	2			
Cassinia laevis		65		3	22	25	10	5
Calytrix glaucophylla		4		1	2	1		
Gahnia aspera								
Aristida caput-medusae								
Dianella spp.								
Fimbristylis dichotoma								
Panicum decompositum								
Cheilanthes sieberi								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7150	→	→	→	→	
Native perennial grass	25	30	20	25	15	
Native other grass (if relevant)						
Native forbs and other species (non-grass)			5	5	5	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	35	40	30	40	30	
Rock						
Bare ground	40	30	45	30	50	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.5.1	NA	LC	NC
Survey result	11.5.1	V	V	"
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	19	No. of logs (>10cm)	7
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	380	Per hectare (x 20)	140

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero

SITE IDENTIFICATION			
Site Name:	Tebrist - TR8	Date:	23.07.2024
Tenure:	PL 1040	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	308379
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6965678
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7177		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%		26-75%	>76%		n/a
Site condition	Very good	Good		Moderate	Poor		Degraded
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)** 2
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	2.5		**Avg DBH (cm) of EDL**	10	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)								
Transect Start compass bearing		Start Easting	308381			End Easting	308375	
		Start Northing	6965703			End Northing	6965654	
Stratum	E	T1	T2		T3	S1	S2/Seedlings	
Height range (m)	12 | 14					1 | 3	0.1 | 0.5	
Canopy cover (%)	2					50	TP	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. cv. Nana		140	2				73	53
Acacia bidwillii		50					33	17
casuarina luehmannii		10					3	7
Eragrostis spp.								
Panicum decompositum								
Aristida capil. medusae								
Chelanthes sieberi								
Fimbristylis dichotoma								
dicrysocephalum apiculatum								
Gahnia aspera								
Dianella caerulea								
Eulalia stricta								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) = Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	71 72	→	→	→	→	
Native perennial grass	10	30	15	10	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	15	20	10	15	30	
Native shrubs (<1m)	10	5	5	5		
Non-native grass						
Non-native forbs and shrubs						
Litter	40	25	40	50	40	
Rock						
Bare ground	25	20	30	20	20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	NA	LC	NCAP
Survey result	11.7.4 Regrowth	11	11	11
Agree with mapped RE? If no, provide justification from field data	YES However, it does not meet criteria to be remnant.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	13	No. of logs (>10cm)	4
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	260	Per hectare (x 20)	20

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

There is high percentage dieback here. Most of the T1 trees got died, but woody shrub layer is very dense. There is scattered fired this location.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

(TR)

Ecological Field Survey ORG-ARW-HSM-FOR-00057

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Tetris1 – TR9	**Date:**	24.07.2024
Tenure:	PL1040	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	309344
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6765051
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 7224		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (*field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content*)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**		
	('Sandy clay loam')	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G
Avg height (m) of EDL	15					**Avg DBH (cm) of EDL**			30		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey (this area not for data) targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	309353			End Easting	309328				
		Start Northing	6965070			End Northing	6965025				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		14	20	6	12	2	6	1	2	x1	x3
Canopy cover (%)		25		10		10		10		5	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. crebra				12	4	5	20	12
Callitris glaucophylla					14	6	3	
Callitris columellaris					3	12	2	3
							12	
Acacia pendula								
Melaleuca decora							2	
Chrysocephalum apiculatum								
Amyema cupulare subsp. medium								
Grevillea asperula								
Panicum decompositum								
Cheilanthes sieberi								
Dianella sp.								
Goodenia								
Melilotus indicus								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7219	→	→	→	→	
Native perennial grass	5	5	5	15	30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	20	20	10	10	15	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	35	40	35	30	30	
Rock						
Bare ground	40	35	50	45	25	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE 30/Gout.	11.7.4/11.5.1	NA	LC	NCAP
Survey result	11.5.1	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	7	No. of hollow logs	7	Total length of logs (>10cm)	16	No. of logs (>10cm)	3
Per hectare (x 20)	x	Per hectare (x 20)	x	Per hectare (x 20)	200	Per hectare (x 20)	60

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species	
V	Vulnerable		
NT	Near Threatened		
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds	
CBS	Colonial Breeding Species		

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

The RE matches with recent mapping RE 11.5.1.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TP2

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris1-TR10	Date:	24.07.2024
Tenure:	PL1040	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	309230
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6964448
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7241		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	(Clearing)	Cultivation	(Regrowth)	(Logging)	(Thinning)	No disturbance						
Dieback	0%	1-25%	(26-75%)	>76%	n/a							
Site condition	Very good	Good	Moderate	(Poor)	Degraded							
Fire scars	Absent	(Scattered)	Frequent	**Time since**	Recent	(Old)	**Average Height (m)**	3				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**(WDL)**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	(T1)	T2	S1	S2	G
Avg height (m) of EDL	13		**Avg DBH (cm) of EDL**	22	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	(Sparse)	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	SE	Start Easting	309213		End Easting	309243						
		Start Northing	6964470		End Northing	6964431						
Stratum	E	T1		T2		T3		S1		S2/Seedlings		
Height range (m)		5	14	4	8	2	4	1	2	0.1	0.9	
Canopy cover (%)		10		10		5		5		3		
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed									
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2				
		TOTALS										
E. exaltata	1.	19		5		2		12				
Corymbia intermedia	3.	9		6	6	10	15	2				
Eucalyptus grandis	2.	3		2	1							
Budgeroo						2						
Alphitonia excelsa								5				
Chrysocephalum apiculatum												
Ehrharta erecta												
Cyanthillium spp												
Dianella caerulea												
Panicum decomposition												
Cheilanthes sieberi												
Arthropodium capillipes												

Ecological Field Survey [illegible]

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7236	→			→	
Native perennial grass	30	20	30	30	20	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10			20	10	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	40	40	40	30	40	
Rock						
Bare ground	20	40	30	20	30	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	NA	LC	NCAP
Survey result	11.7.4 Regrowth	〃	〃	〃
Agree with mapped RE? If no, provide justification from field data	Yes, but it is regrowth.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	3	Total length of logs (>10cm)	36	No. of logs (>10cm)	19
Per hectare (x 20)	X	Per hectare (x 20)	60	Per hectare (x 20)	720	Per hectare (x 20)	380

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Hollow logs					

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

This location mainly regrowth area as mostly dead and new plants are growing.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR4

targetzero
► zero incidents ► zero harm

SITE IDENTIFICATION			
Site Name:	Tetris 1 - TR12	Date:	24.07.2024
Tenure:	PL 1040	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	308738
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6965071
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7281		#	
East	# ↓		#	
South	#		#	
West	# ↓		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	('Sandy loam')	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered		Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

targetzero

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	12					**Avg DBH (cm) of EDL**			20			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Aphta Spicata	scattered				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	308753			End Easting	308718				
		Start Northing	6965086			End Northing	6965060				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		10	14	4	8	2	4	1	2	0.1	0.7
Canopy cover (%)		15		10		10		10		5	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus				5	6	6	12	
Callitris glaucophylla				6	3	3	5	
Lysicarpus angustifolius					3	5	6	
Acacia leiocalyx						7	7	5
Alphitonia excelsa								
Cheilanthes sieberi								
Stenocarpus sinuatus								
Pavetta lasianthoides								
Dianella sp.								
Entolasia stricta								
Lomandra sp.								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7276	→	→	→	→	
Native perennial grass	5	5	10	10	5	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5	15	15	15	40	
Native shrubs (<1m)	5		10			
Non-native grass						
Non-native forbs and shrubs						
Litter	30	30	40	50	30	
Rock						
Bare ground	55	50	25	25	25	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	N/A	LC	NC
Survey result	11.7.4	11	11	11
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	14	No. of logs (>10cm)	5
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	280	Per hectare (x 20)	50

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species	
V	Vulnerable		
NT	Near Threatened		
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds	
CBS	Colonial Breeding Species		

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Dieback percentage is very high here

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR5

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Tetris 1 - TR13	Date:	24.07.2024
Tenure:	PL1040	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	308483
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6964364
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7302		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	(W)	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	('Sandy loam')	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered		Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%	26-75%	>76%		n/a	
Site condition	Very good	Good	Moderate	Poor		Degraded	
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)** ?
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL				3		**Avg DBH (cm) of EDL**			8			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey [illegible] targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)								
Transect Start compass bearing	W	Start Easting	308506		End Easting	308455		
		Start Northing	6064359		End Northing	6064361		
Stratum	E	T1	T2	T3	S1	S2/Seedlings		
Height range (m)		2 | 6			1 | 2	0.1 | 0.9		
Canopy cover (%)		20			20	10		
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia tetanifolia				7			225	25
Dodonaea viscosa				3			2	1
Ficus sycomorus				7			18	2
Grahtia kappa.								
Cheilanthes sieberi								
Aristida contorta								
Enteropogon ramosus								
Panicum decompositum								
Melaleuca viridiflora								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	15	5	5	10	5	
Native perennial grass						
Native other grass (if relevant)						
Native forbs and other species (non-grass)	15	10	20	15	10	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	40	30	35	40	65	
Rock						
Bare ground	30	55	40	35	20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	NA	LC	NC
Survey result	11.7.4 Regrowth	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES, but it is regrowth			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	7	No. of logs (>10cm)	4
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	140	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

9f is a Recent burnt area.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR3

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Tetris1 – TR14	Date:	24.07.2024
Tenure:	PL1040	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	390623
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6963745
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7326		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%	26-75%	>76%	n/a		
Site condition	Very good	Good	Moderate	Poor	Degraded		
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)** 3
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	2		**Avg DBH (cm) of EDL**	13	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)							
Transect Start compass bearing	W	Start Easting	308435	End Easting	308440		
		Start Northing	6963648	End Northing	6963649		
Stratum	E	T1	T2	T3	S1	S2/Seedlings	
Height range (m)		4 | 6		2 | 4	1 | 2	0.1 | 0.3	
Canopy cover (%)		20		10	5	5	
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed				
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. tereticornis				3			5	3
Lysicarpus angustifolius				8		10	3	6
Melaleuca spp.		3		3				
Alphitonia excelsa		3						3
Aristida caput-medusae								
Cheilanthes sieberi								
Calytrix exstipulata								
Dampiera stricta								
Pultenaea spp.								
Eragrostis spp.								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7321	→	→	→	→	
Native perennial grass	25	15	5	10	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)		10		5		
Native shrubs (<1m)			15			
Non-native grass						
Non-native forbs and shrubs						
Litter	25	25	20	30	25	
Rock						
Bare ground	50	60	60	55	65	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (BD)	11.5.1	NA	LC	NC
Survey result	11.7.4 Regrowth	"	"	"
Agree with mapped RE? If no, provide justification from field data	NO, vegetation match with RE 11.7.4			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	13	No. of logs (>10cm)	6
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	260	Per hectare (x 20)	120

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

completely burnt area.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

FR7

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Tetris - TR15	Date:	24.07.2024
Tenure:	PL1040	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	390623
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6563745
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7336		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	(Sandy loam)	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:				
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance				
Dieback	0%	1-25%	26-75%	>76%	n/a					
Site condition	Very good	Good	Moderate	Poor	Degraded					
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	4		
Disturbance notes										

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G
Avg height (m) of EDL	14					**Avg DBH (cm) of EDL**			25		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)								
Transect Start compass bearing	S	Start Easting	309078		End Easting	309047		
		Start Northing	6063766		End Northing	6063720		
Stratum	E	T1		T2	T3		S1	S2/Seedlings
Height range (m)	1	12 | 16		1	2 | 4		1 | 2	0·1 | 0·1
Canopy cover (%)		10			5		20	5
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. crebra		875		7		2	43	32
Callitris glaucophylla						2		
Acacia leiocalyx		506					25	32
Allocasuarina luehmannii		3						5
Alectia rishfeldta		7						7
chrysocephalum apiculatum								
Cahlia dyeri								
Dichanthium sericeum								
Aristida caput-medusae								
Enteropogon strictus								
Eragrostis spp								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			F	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	1330	→	→	→	→	
Native perennial grass	15	15	60	40	15	
Native other grass (if relevant)						
Native forbs and other species (non-grass)		15		15	40	
Native shrubs (<1m)	10		15	10		
Non-native grass						
Non-native forbs and shrubs						
Litter	25	40	15	20	30	
Rock						
Bare ground	50	30	10	15	15	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	NA	LC	NC
Survey result	11.5.1 Regrowth.		N	V
Agree with mapped RE? If no, provide justification from field data	No. Vegetation composition match with RE 11.5.1			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)		No. of hollow logs		Total length of logs (>10cm)	17	No. of logs (>10cm)	4
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Recent burn 2012

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR1

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Tetris1-TR16	Date:	25.07.2024
Tenure:	PL1040	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	307769
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6965451
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7372	7372	#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	(W)	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	('Sandy loam')	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)		(Forestry)		Cropping		Conservation		(Mining)		Other:	
Evidence	(Clearing)		Cultivation		(Regrowth)		Logging		Thinning		No disturbance	
Dieback	0%		1-25%			26-75%			(>76%)			n/a
Site condition	Very good		Good			Moderate			(Poor)			Degraded
Fire scars	Absent	Scattered	(Frequent)	**Time since**	(Recent)		Old	**Average Height (m)**	10			
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	(T1)	T2	S1	S2	G
Avg height (m) of EDL	12		**Avg DBH (cm) of EDL**	20	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	(10-30% (sparse))	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	(Sparse)	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey (this data now from field) targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	W	Start Easting	307795			End Easting	307749				
		Start Northing	6965444			End Northing	6965448				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)	6 | 12	4	6			2	4	1	2	0.1	0.5
Canopy cover (%)	5	10				15		5		5	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Cenchrus glaucophylla			20*	20	5	3	2	
Amaranthus leucocarpa			5*	5	2	1	10	5
Dichrostachys (Lycium cinereum)						3	1	
Acacia tetragonophylla						3	121	56
Acacia spondylophylla							10	2
Alphitonia excelsa								
Panicum spp.								
Phyllanthus gilberti								
Aristida sp. Pt. medusae								
Chrysocephalum apiculatum								
Dianella spp.								
Gahnia aspera								
Lomandra patens								
Solanum spp.								

* burnt

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) = Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7367	→	→	→	→	
Native perennial grass	15	30	25	5	20	
Native other grass (if relevant)	5		5	5		
Native forbs and other species (non-grass)	30	10	25	50	15	
Native shrubs (<1m)				5		
Non-native grass						
Non-native forbs and shrubs						
Litter	30	40	30	25	35	
Rock						
Bare ground	20	20	15	10	30	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.5.1	NA	LC	NC
Survey result	11.5.1 (Regrowth)	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES, but it is regrowth due to recent fire.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	5	No. of logs (>10cm)	2
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	100	Per hectare (x 20)	40

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

It is a burnt area, mostly regrowth and most high canopy trees burnt.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero
► zero incidents ► zero harm

SITE IDENTIFICATION			
Site Name:	Tetris-TR17	Date:	25.07.2024
Tenure:	PL1040	Assessor(s):	Nagim Waldiw

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	367854
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6964668
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7 to 89		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered		Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	5				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2			G
Avg height (m) of EDL	12					**Avg DBH (cm) of EDL**			23			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	5	Start Easting	307868	End Easting	307845
		Start Northing	6964603	End Northing	6964749

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)	1	5 | 16	1	2 | 6	1 | 2	0.1 | 0.9
Canopy cover (%)		20		15	20	10

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. crebra		6		6				
Eucalyptus spp.		22		6			10	9
Lysicarpus angustifolius		11		4		2	5	
Callitris glaucophylla		15		9		6		
Aholaspartina lucknowii						56	112	92
Alphitonia excelsa								2
Cheilanthes sieberi								3
Paspalidium spp.								
Fimbristylis dichotoma								
Chrysocephalum apiculatum								
Aristida ramosa subsp. muelleriana								
Bothriochloa								
Dodonaea viscosa								
Whitehillia tetraptera								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7384 →					
Native perennial grass	15	40	5		10	
Native other grass (if relevant)	5		5			
Native forbs and other species (non-grass)	20	20	40	10		
Native shrubs (<1m)	20					
Non-native grass						
Non-native forbs and shrubs						
Litter	25	35	40	30	30	
Rock						
Bare ground	15	5	10	60	60	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (30)	11.7.4	NA	LC	NC
Survey result	11.7.4	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	8	No. of logs (>10cm)	4
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	160	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Burnt zone. High canopy trees Since callitris got died.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR 3

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	TETRIS1-TR18	Date:	25.07.2024
Tenure:	PL1040	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	307481
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6964012
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7410		#	
East	# ↓		#	
South	#		#	
West	# ↓		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:				
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance				
Dieback	0%	1-25%	26-75%	>76%	n/a					
Site condition	Very good	Good	Moderate	Poor	Degraded					
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	5		
Disturbance notes										

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	14		**Avg DBH (cm) of EDL**	28	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	S	Start Easting	307481			End Easting	307480					
		Start Northing	6964040			End Northing	6963991					
Stratum	E	T1		T2		T3		S1		S2/Seedlings		
Height range (m)	1	8	16	6	10	2	6	1	2	0.1	0.9	
Canopy cover (%)		25		10		5		10		3		
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed									
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2				
		TOTALS										
Eucalyptus		18		17	2	2	1					
Callitris glaucophylla		20		12	3	5						
Dodonaea		13			5	3	5					
Acacia tetragonophylla		25				10	56	5				
Alphitonia excelsa		21						2				
Eragrostis parviflora												
Solanum spp.												
Aristida contorta												
Paluum decumbens												
Cyanthillium spp.												

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7405	→	→	→	→	
Native perennial grass	5	10	5	5	10	
Native other grass (if relevant)	5	5	5	5	10	
Native forbs and other species (non-grass)	20	30	20	40	30	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	50	35	45	30	40	
Rock						
Bare ground	20	20	25	20	10	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.5.1	NA	LC	NC
Survey result	11.5.1	11	11	11
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	~	No. of hollow logs	~	Total length of logs (>10cm)	24	No. of logs (>10cm)	8
Per hectare (x 20)	~	Per hectare (x 20)	~	Per hectare (x 20)	480	Per hectare (x 20)	160

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species	
V	Vulnerable		
NT	Near Threatened		
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds	
CBS	Colonial Breeding Species		

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	Yes / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

This 2ha also burnt 2ha.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TP 4

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero ruins

SITE IDENTIFICATION			
Site Name:	Tetris1 - TR19	**Date:**	25.07.2024
Tenure:	PL 1040	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	306677
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6963970
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 7419		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	(NW)	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	('Sandy loam')	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	5				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	6		**Avg DBH (cm) of EDL**	12	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey (See also NSW FOR [illegible])

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)								
Transect Start compass bearing	NW	Start Easting	306696	End Easting	306654			
		Start Northing	6963956	End Northing	6963981			
Stratum	E	T1	T2	T3		S1		S2/Seedlings
Height range (m)	6 | 17	1	1	2	6	1	2	0.5 | 0.7
Canopy cover (%)	10			20		10		5

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. crebra/E. sp.			5*			3		
Callitris glaucophylla			13*			2		
Acacia leiocalyx						11	5	22
Acacia spp.								10
Alphitonia excelsa								
Cymbopogon spp.								
Panicum decompositum								
Aristida caput-medusae								
Chrysocephalum apiculatum								
Chloris ventricosa								
Melinis repens								
Poa sp.	umbellata							

* get burnt and died

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7414	→	→	→	→	
Native perennial grass	20	10	30	25	15	
Native other grass (if relevant)		5	5	5		
Native forbs and other species (non-grass)	10	20	15	10	10	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	50	40	40	40	35	
Rock						
Bare ground	20	25	10	20	40	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	NA	LC	NC
Survey result	11.7.4	Regrowth	↓	↓
Agree with mapped RE? If no, provide justification from field data	YES, but it is regrowth due to fire.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	20	No. of logs (>10cm)	8
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	400	Per hectare (x 20)	160

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species	
V	Vulnerable		
NT	Near Threatened		
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds	
CBS	Colonial Breeding Species		

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation Clearing.
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

This is burnt area, High canopy trees got died due to fire and other reasons.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR5

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris-TR20	Date:	25.07.2027
Tenure:	PL1040	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	306123
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6964409
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7499		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	5				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	5					**Avg DBH (cm) of EDL**			15			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey

target zero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	306140	End Easting	306104
		Start Northing	6964426	End Northing	6964351

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		4 | 8		2 | 4	1 | 2	0.1 | 0.2
Canopy cover (%)		15		12	10	5

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. crebra		60		23		17	15	5
Acacia leiocalyx				33		15	27	32
Lysicarpus angustifolius							3	3
Alphitonia excelsa								3
Acacia spp.							2	2
Cheilanthes sieberi								
Aristida caput-medusae								
Chrysocephalum apiculatum								
Melinis repens								
Chloris spp.								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7434	→	→	→	→	
Native perennial grass	10	10	15	10	15	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	25	20	30	10	20	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs	5	5				
Litter	40	35	30	35	35	
Rock						
Bare ground	20	30	25	45	30	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (30)	11.7.4	NA	LC	NC
Survey result	11.7.4 (Regrowth)	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES but it is regrowth			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	17	No. of logs (>10cm)	7
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	340	Per hectare (x 20)	140

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Regrowth area, burnt area.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TRL

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris 1 - TR21	**Date:**	25.07.2024
Tenure:	PL1040	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	306967
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6964740
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 7457		#	
East	# ↓		#	
South	#		#	
West	# ↓		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	(NW)	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**		
	('Sandy clay loam')	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing		Forestry		Cropping		Conservation		Mining		Other:	
Evidence	Clearing		Cultivation		Regrowth		Logging		Thinning		No disturbance	
Dieback	0%		1-25%		26-75%			>76%			n/a	
Site condition	Very good		Good		Moderate			Poor			Degraded	
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent		Old		**Average Height (m)**	4		
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	4					**Avg DBH (cm) of EDL**			28			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey

target zero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	NW	Start Easting	306979			End Easting	306918					
		Start Northing	6964729			End Northing	6964767					
Stratum	E	T1		T2		T3		S1		S2/Seedlings		
Height range (m)		10	15			2	6	1	2	0.1	0.3	
Canopy cover (%)		25				10		15		5		
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed									
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3		S1		S2		
		TOTALS										
Eucalyptus				7		3						
Corymbia trachyphloia				6								
Callitris glaucophylla				13*		9		5		2		
Melaleuca				1				1		5		
Allocasuarina luehmannii												
Acacia leiocalyx						35		55		16		
Alphitonia excelsa										21		
Cheilanthes sieberi												
Solanum spp.												
Aristida scopulorum												
Gahnia aspera												
Dianella spp.												
Cyanthillium spp												

Melinis repens

* got died due to fire and other reasons

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7452	→	→	→	→	
Native perennial grass	30	30	15	20	5	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	15	10	15	10		
Native shrubs (<1m)	10	5				
Non-native grass						
Non-native forbs and shrubs						
Litter	30	30	45	50	60	
Rock						
Bare ground	15	25	25	20	35	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	NA	LC	NC
Survey result	11.7.4	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	9	No. of logs (>10cm)	4
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	180	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species	
V	Vulnerable		
NT	Near Threatened		
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds	
CBS	Colonial Breeding Species		

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

* Some tall trees mostly eucalyptus dieback due to fire and other reasons.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Tr 7

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Tetris 1 - TR22	Date:	25.07.2024
Tenure:	PL1040	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	706227 6965048
☐ Pilot Well + Dam	☐ Dam	Northing (N)	
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7467		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)			
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)			
Aspect	N	S	E	W	NE	NW	SE	(SW)	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	(Sandy loam)	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion		(Absent)	Scattered		Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing		Forestry		Cropping		Conservation		Mining		Other:	
Evidence	Clearing		Cultivation		Regrowth		Logging		Thinning		No disturbance	
Dieback	0%		1-25%				26-75%		>76%			n/a
Site condition	Very good		Good				Moderate		Poor			Degraded
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent		Old		**Average Height (m)**	5		
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	9					**Avg DBH (cm) of EDL**			9			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SW	Start Easting	306247	End Easting	306206
		Start Northing	6965060	End Northing	6965041

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		4 | 10		2 | 4	1 | 2	0.1 | 0.3
Canopy cover (%)		15		10	5	5

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Angophora leiocarpa		4		4				
Melaleuca		8		6		2		
Lysicarpus angustifolius		5		2		3		
Acacia leiocalyx		80		15		32	21	12
Alphitonia excelsa		11						11
Acacia calyculata		30						30
Cheilanthes sieberi								
Dianella spp.								
Aristida caput-medusae								
Paspalum spp.								
Eucalyptus apicalis								
Poaceae undet.								
Eragrostis spp.								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7462 →				→	
Native perennial grass	5	5	5	15	20	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5	10	15	15	25	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	50	60	50	50	30	
Rock						
Bare ground	40	25	30	20	25	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	NA	LC	NC
Survey result	11.7.4 Regrowth	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES, but regrowth.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	13	No. of logs (>10cm)	5
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	260	Per hectare (x 20)	100

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Burnt zone, vegetation does not fulfill the criteria to be remnant, it is considered as regrowth.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR1

Ecological Field Survey ORG-ARW-HSM-FOR-00087

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris1-TR23	**Date:**	25.07.2024
Tenure:	PL1040	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	306482
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7065689
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 7483		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:				
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance				
Dieback	0%	1-25%	26-75%	>76%	n/a					
Site condition	Very good	Good	Moderate	Poor	Degraded					
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	4		
Disturbance notes										

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G
Avg height (m) of EDL	18					**Avg DBH (cm) of EDL**			33		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NW	Start Easting	306503			End Easting	306463				
		Start Northing	6965677			End Northing	6965709				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)	1	18	22	8	12	2	4	1	2	0	3
Canopy cover (%)		20		10		5		5		7	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. Chlorocladia		18		16	2			
E. crebra		12		7	3	2		
Lysicarpus angustifolius		14			8	2	1	2
Calitris glaucophylla		11			7	3	2	
Melaleuca		2				2		
Acacia leiocalyx		9					7	2
Alphitonia excelsa		7						7
Banksia spinulosa								
Aristida caput-medusae								
Lomandra spp.								
Cheilanthes sieberi								
Paricum								
Aristida spp.								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7478	→				
Native perennial grass	10	20	20	15	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	15	10	10	15	35	
Native shrubs (<1m)	15					
Non-native grass						
Non-native forbs and shrubs						
Litter	40	50	45	50	40	
Rock						
Bare ground	20	20	25	20	15	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE 3D/Govt.	11.7.4/11.5.4	NA	LC	NC
Survey result	11.5.4	〃	〃	〃
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	7	No. of logs (>10cm)	5
Per hectare (x 20)	X0	Per hectare (x 20)	X	Per hectare (x 20)	140	Per hectare (x 20)	60

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	(Yes) / No (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Softened fire zone.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TV1

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Tetris1 - TR24	**Date:**	26.07.2024
Tenure:	PL1040	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	307168
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965450
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 7512		#	
East	# ↓		#	
South	# ↓		#	
West	# ↓		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ~~ESU or~~ 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (**field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content**)	'Sand'	'Loamy sand'	'Clayey sand'	('Sandy loam')	'Loam'	'Silty loam'		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	(Grazing)	(Forestry)	Cropping	Conservation	Mining	Other:	
Evidence	(Clearing)	Cultivation	(Regrowth)	Logging	Thinning	No disturbance	
Dieback	0%	(1-25%)	26-75%		>76%		n/a
Site condition	Very good	(Good)	Moderate		Poor		Degraded
Fire scars	Absent	(Scattered)	Frequent	**Time since**	Recent	(Old)	**Average Height (m)** 3
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)	T2			S1			S2			G	
Avg height (m) of EDL	12				**Avg DBH (cm) of EDL**			24				
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)			(10-30% (sparse))			<10% (very sparse)			n/a	
Functional shrub layer density (<2m)	Dense/closed	Mid-dense			(Sparse)			Very sparse			Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	E	Start Easting	307141			End Easting	307198				
		Start Northing	6965458			End Northing	6965453				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)	1	10	16	4	8	2	4	1	2	0.1	0.3
Canopy cover (%)		22		5		7		3		2	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eremea		8		8				
Anagephora leiocarpa		1		1				
Carpobrotus glaucescens		59		15	22	17	5	
						9	25	15
Acacia leiocalyx		49						
Alphitonia excelsa								
Chelanthes sieberi								
Arigbodo capitatum								
Chrysocephalum apiculatum								
Pelargonium australe								
Solanum spp.								
Cyanthillium spp.								
Dianella caerulea								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7507 →					
Native perennial grass	10	10	15	20	20	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	10	10		30	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	40	45	50	50	30	
Rock						
Bare ground	40	35	25	30	20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.5.1	NA	LC	NC
Survey result	11.5.1	〃	〃	〃
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	7	No. of logs (>10cm)	3
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	140	Per hectare (x 20)	60

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR2

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Tetris 1 - TR25	**Date:**	26.07.2027
Tenure:	PL 1040	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	305767
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965701
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 7542		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	(NE)	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (**'field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content**)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion		(Absent)	Scattered		Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	8 m				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2			G
Avg height (m) of EDL	14					**Avg DBH (cm) of EDL**			25			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)							
Transect Start compass bearing	NE	Start Easting	305750	End Easting	305787		
		Start Northing	6965686	End Northing	6965714		
Stratum	E	T1	T2	T3	S1	S2/Seedlings	
Height range (m)	1	10 | 18	4 | 8	1 | 4	1 | 2	0 | 0.9	
Canopy cover (%)		20	10	5	5	2	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E wehra		8		7		1		
Callitris glaucophylla		20		11	5	1	3	
Eucalyptus		13		1	4	3	5	
Casuarina cristata		3				3		
						9	5	3
Acacia tetragonophylla		17				4		
Cheilanthes sieberi								
Aristida contorta								
Panicum spp.								
Cenchrus setiger								
Alphitonia excelsa								
Chrysocephalum apiculatum								
Lomandra patens								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7537	→	→	→	→	
Native perennial grass	10	20	15	20	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	10	25	25	5	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	45	40	40	35	60	
Rock						
Bare ground	35	30	20	20	25	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	NA	LC	NC
Survey result	11.7.4	〃	〃	〃
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	21	No. of logs (>10cm)	11
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	420	Per hectare (x 20)	220

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

This plant is the same for E. crebra and Callitris grassy land.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR3

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Tetris1-TR26	Date:	26.07.2024
Tenure:	PL1040	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	304928
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6965604
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7561		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

targetzero
► zero residents ► zero ranks

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing		Forestry		Cropping		Conservation		Mining		Other:	
Evidence	Clearing		Cultivation		Regrowth		Logging		Thinning		No disturbance	
Dieback	0%		1-25%		26-75%		>76%		n/a			
Site condition	Very good		Good		Moderate		Poor		Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent		Old		**Average Height (m)**	5		
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	7		**Avg DBH (cm) of EDL**	12	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	304929	End Easting	304927
		Start Northing	6965626	End Northing	6965576

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)	1	6 | 12	1	2 | 4	1 | 2	0·1 | 0·9
Canopy cover (%)		20		15	10	5

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. clavodictyon		53		19		22	9	3
Melaleuca nodosa		36		5		16	10	5
Corymbia lucasiana		34				5	10	12
E. crebra		5				5		
Acacia leiophylla		35						35
Dianella caerulea								
Lomandra sp.	Patens							
Aristida ramosa var. muelleriana								
Chrysocephalum apiculatum								
Melinis repens.								
Cheilanthes sieberi								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7555	→	→	→	→	
Native perennial grass	10	20	10	10	5	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10		10	5	10	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	40	30	50	30	35	
Rock						
Bare ground	40	50	30	55	50	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (BD)	11.5.4	NA	LC	NC
Survey result	11.5.21 Regrowth		4	11
Agree with mapped RE? If no, provide justification from field data	YES. but it is regrowth			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	9	No. of logs (>10cm)	4
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	180	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Vegetation does not fulfill the criteria to be removed. Or is regrowth.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR1

Ecological Field Survey

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris-TR27	**Date:**	05.08.2024
Tenure:	PL 1040	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	304502
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6945013
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 7624		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	(N)	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil (field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	('Sandy loam')	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)						
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance
Dieback	0%	1-25%	26-75%	>76%	n/a	
Site condition	Very good	Good	Moderate	Poor	Degraded	
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old
Average Height (m)	5 m					
Disturbance notes						

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	10					**Avg DBH (cm) of EDL**			21			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey [illegible] targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	N	Start Easting	304512			End Easting	304498				
		Start Northing	6964995			End Northing	6965037				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)	1	8	14	4	8	2	4	1	2	0.1	0.9
Canopy cover (%)		12		10		5		3		2	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus				2			3	
Corymbia clarksoniana				4	3	2	5	6
Allocasuarina inophloia				5	1	1	12	5
A. Eucarpa				1				
Budgeroo				3		3	4	
Alphitonia excelsa							1	5
Carissa glaucophylla							2	1
Allocasuarina luehmannii								2
Aristida caput-medusae								
Chrysopogon sieberi								
Gahnia aspera								
Dianella spp.								
Fimbristylis dichotoma								
Lomandra [illegible]								
Dodonaea triangularis								
Ozothamnus diosmifolius								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7619	→	→	→	→	
Native perennial grass	5	5				
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5	5		5		
Native shrubs (<1m)	10					
Non-native grass						
Non-native forbs and shrubs						
Litter	55	80	80	60	80	
Rock						
Bare ground	25	10	20	35	20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (-30)	11.7.4	NA	LC	NC
Survey result	11.5.4 Regrowth	4	4	4
Agree with mapped RE? If no, provide justification from field data	No, the vegetation match with 11.5.4			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	11	No. of logs (>10cm)	5
Per hectare (x 20)	X	Per hectare (x 20)	V	Per hectare (x 20)	220	Per hectare (x 20)	100

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for nectar / pollen	Absent	(Scattered)	Common	Abundant
Potential for fleshy fruiting plants	Absent	(Scattered)	Common	Abundant
Potential for seeding grass cover	Absent	(Scattered)	Common	Abundant
Dense shrub/grass shelter	Absent	(Scattered)	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	(Scattered)	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	(Absent)	Scattered	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	(Absent)	Scattered	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	(Scattered)	Common	Abundant
Termite mounds (>50cm)	Absent	(Scattered)	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	Absent	(Scattered)	Common	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	(Scattered)	Common	Abundant
Mistletoe/Epiphytes	(Absent)	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

of poles like scattered large drays as frequent fire scars. Of is a regrowth zone.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Trial 2

Ecological Field Survey

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris1 - TR28	**Date:**	05.08.2021
Tenure:	PL1040	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	305371
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965036
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 7638		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (*field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content*)	'Sand'	'Loamy sand'	'Clayey sand'	(Sandy loam')	**'Loam'**	**'Silty loam'**		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion		(Absent)	Scattered		Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing		Forestry		Cropping	Conservation		Mining		Other:		
Evidence	Clearing		Cultivation		Regrowth	Logging		Thinning		No disturbance		
Dieback	0%		1-25%			26-75%		>76%			n/a	
Site condition	Very good		Good			Moderate		Poor			Degraded	
Fire scars	Absent	Scattered	Frequent		**Time since**	Recent		Old		**Average Height (m)**	5	
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2			S1			S2		G
Avg height (m) of EDL	6					**Avg DBH (cm) of EDL**			18			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey (to be undertaken) targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	E	Start Easting	305348			End Easting	305394				
		Start Northing	6965033			End Northing	6965036				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		6	12			2	6	1	2	0.1	0.9
Canopy cover (%)		10				10		10		5	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. Chlorocladon		29		5		3	18	11
Eragrostis a. lehmanniana		2		2				
Melaleuca decora		2		2				
E. Crebra		16		1		3	12	
A|O Corymbia hendersonii		91					39	52
Paspalum dilatatum								
Salvia aspera								
Dianella caerulea								
Flueggea virosa								
Chrysocephalum apiculatum								
Cheilanthes sieberi								
Lomandra patens								
Dodonaea spp.								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7633	→	→	→	→	
Native perennial grass	5	5	5	10	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5	5	5	5	10	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	60	65	70	55	55	
Rock						
Bare ground	30	25	20	30	25	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
(3D)	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.4	NA	LC	NC
Survey result	11.5.4 Regrowth	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES, but it is regrowth			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	9	No. of logs (>10cm)	5
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	180	Per hectare (x 20)	100

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Old fire burnt area die back Eg.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR3

Ecological Field Survey

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris 1 - TR29	**Date:**	05.08.2024
Tenure:	PL 1046	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	305339
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6964272
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 7151		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ~~ESU or 100m x 100m~~ area (broad assessment – random meander)									
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	N	S	E	(W)	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (**'field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content**)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**			
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**			
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	5m				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	4m		**Avg DBH (cm) of EDL**	12	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey – Template for use with targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	W	Start Easting	305363	End Easting	305314
		Start Northing	6264264	End Northing	6264293

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		2 | 6			1 | 2	0·11 | 0·9
Canopy cover (%)		30			20	10

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. Cladocalyx		24		45			25	21
E. Preissiana		10		7			3	
Acacia retinodes		63		22			25	13
Acacia cultriformis		16					11	5
Leucophyta brownii		4						4
Atriplex cinerea								
Panicum decompositum								
Lomandra patens								
Gahnia aspera								
Eutaxia sericea								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7646	→	→	→	→	
Native perennial grass					5	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	40	60	60	30	40	
Rock						
Bare ground	60	40	40	70	55	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (305)	11.5.4	NA	LC	NC
Survey result	11.5.4 Regrowth	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES, but it is regrowth			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	4	No. of hollow logs	4	Total length of logs (>10cm)	7	No. of logs (>10cm)	4
Per hectare (x 20)	4	Per hectare (x 20)	4	Per hectare (x 20)	140	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Dr Scrub regrowth, E. chloroclada and Acacia leiocalyx dominated.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR9

Ecological Field Survey

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris 1 - TR30	**Date:**	05.08.2024
Tenure:	PL1040	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	3041534
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6964208
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 7671		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	(SW)	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	(Sandy loam)	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	3				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	6					**Avg DBH (cm) of EDL**			17			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SW	Start Easting	304550	End Easting	304522						
		Start Northing	6964226	End Northing	6964193						
Stratum	E		T1		T2		T3		S1		S2/Seedlings
Height range (m)	12	16	4	10	1		2	4	1	2	0.1 0.9
Canopy cover (%)			20				10		5		5

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. chloroclada		14		9		3	2	
E. erebra		5				2	3	
Lycicarpus angustifolius		44		10		21	13	10
Melaluca spp.		33					21	12
Acacia leiocalyx		39		11			16	12
Eucalyptus spp.		1	1				[illegible]	[illegible]
Corymbia glaucophylla		5		5				
Solanum spp								
Orchidaceae								
Grahnia scabra								
Cheilanthes sieberi								
Dianella spp								
Chrysocephalum apiculatum								

Ecological Field Survey [illegible]

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7666	→	→	→	→	
Native perennial grass		5				
Native other grass (if relevant)						
Native forbs and other species (non-grass)		5	5			
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	60	60	65	70	90	
Rock						
Bare ground	40	30	30	30	10	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	NA	LC	NCAP
Survey result	11.7.4	〃	〃	〃
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	14	No. of logs (>10cm)	5
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	280	Per hectare (x 20)	100

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Tetris 1-TR36	**Date:**	05 Aug 2024
Tenure:	PL1040	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	304477
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965521
☐ Monitoring	☑ Pipeline	**Datum**	~~GDA94~~, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	GDA2020
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 1		#	
East	# 2		#	
South	# 3		#	
West	# 4		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain ✓
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%) ✓	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW ✓	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red			
	Black	Grey	Pale ✓	Dark	Mottled			
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’ ✓	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent ✓		Scattered		Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate ✓	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent ✓	**Time since**	Recent ✓	Old	**Average Height (m)**	3				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ✓	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2 ✓		S1		S2		G			
Avg height (m) of EDL	3				**Avg DBH (cm) of EDL**		13					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse) ✓		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse ✓		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below	Not Found On Site ✓

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	208 SW	Start Easting	304498			End Easting	304454					
		Start Northing	6965543			End Northing	6965507					
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)			7	12	2	5			1	2	0.1	1
Canopy cover (%)			10		20				5		5	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra				7			2	
Melaleuca decora					20			
Eucalyptus viridis								
Callitris glaucophylla							2	
Allocasuarina luehmannii							3	
Hakea purpurea					15			
Cheilanthes sieberi								
Lomadra leucocephala								
Chrysocephalum apiculatum								
Calotis dentex								
Fimbristylis dichotoma								
Eragrostis speciosa								
Aristida calycina								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	5	6	7	8	9	
Native perennial grass	30	20	20	20	60	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	20		10	20	20	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter						
Rock	20	70	30	10	10	
Bare ground	20	10	40	50	10	
Cryptogams	10					
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.7.4	N/A	LC	NCAP
Survey result	11.7.4	N/A	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	0	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common ✓	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common ✓	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common ✓	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered ✓	Common	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Coarse woody debris	Absent ✓	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common ✓	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	N/A	**No. of trees with hollows (>30cm)**	N/A

GREY SNAKE habitat suitability analysis (Grey snake habitat must have the presence of suitable land use, landform, and micro-habitat features within 50 m of freshwater)		
1. LAND USE	No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks). (AND)	Yes / No
2. LANDFORM	Presence of suitable landform (defined as Plains, 'alluvial plain or flat, flood plain' or 'inland clay pan' or 'unspecified, flat, gentle slopes, undulating terrain'; Streams, any feature; Water, any feature (excluding saltwater features). (AND)	Yes / No
3. PHYSIOGRAPHY / Soil	Presence of cracking clay soils (Vertosols, generally >30% clay; defined as 'clay loam' to 'heavy clay') and/or soil cracks (defined as > 5mm wide and 50mm deep: Scattered, Common or Abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief. (OR)	Yes / No
4. FAUNA HABITAT	Presence of habitat providing suitable shelter (e.g. leaf litter, coarse woody debris; defined as 'leaf litter depth' – multiple or deep layers or 'leaf litter coverage' – abundant or 'coarse woody debris' – abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief.	Yes / No
Grey snake habitat	**PRESENT** (Grey snake habitat present if: Items 1 and 2 are present in association with 3 and/or 4)	**ABSENT**

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
N/A					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation or soil profile disturbance
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Threatened species core habiat
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No Yes / No ✓ ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes ✓	No	
Notes			

North face of ESU

East face of ESU

South face of ESU

West face of ESU

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Tetris 1-TR37	**Date:**	05 Aug 2024
Tenure:	PL1040	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	302481
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965504
☐ Monitoring	☐ Pipeline	**Datum**	GDA2020, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 10		#	
East	# 11		#	
South	# 12		#	
West	# 13		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain ✓
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	N	S	E	W ✓	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale ✓	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’ ✓	**‘Loam’**	**‘Silty loam’**			
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**			
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)					
Erosion	Absent ✓	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate ✓	Poor	Degraded							
Fire scars	Absent ✓	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ✓	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1 ✓	T2	S1	S2	G							
Avg height (m) of EDL	10		**Avg DBH (cm) of EDL**	30								
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse) ✓	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse ✓	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below	Not Found On Site ✓

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	259 W	Start Easting	302504			End Easting	302455						
		Start Northing	6965495			End Northing	6965522						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			9	15	2	8			1	2	0.1	1	
Canopy cover (%)			20		10				5		5		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Angophora leiocarpa		14		14				
Acacia crassa		5					5	
Lysicarpus angustifoloius		22		7	15			
Eucalyptus viridis		3			3			
Melaleuca decora		3					3	
Chrysocephalum apiculatum								
Calotis cuneifolia								
Calotis dentex								
Bidens pilosa								
Chrysocephalum apiculatum								
Aristida calycina								
Lomadra leucocephala								
Pomax umbellata								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	30	31	32	33	34	
Native perennial grass	10			10	20	
Native other grass (if relevant)						
Native forbs and other species (non-grass)		10				
Native shrubs (<1m)				40	30	
Non-native grass						
Non-native forbs and shrubs						
Litter	80	80	90	40	40	
Rock						
Bare ground	10	10	10	10	10	
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.7.4	N/A	LC	NCAP
Survey result	11.7.4	N/A	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	0	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common ✓	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common ✓	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered ✓	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common ✓	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Coarse woody debris	Absent ✓	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent ✓	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered ✓	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	N/A	**No. of trees with hollows (>30cm)**	N/A

GREY SNAKE habitat suitability analysis (Grey snake habitat must have the presence of suitable land use, landform, and micro-habitat features within 50 m of freshwater)		
1. LAND USE	No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks). (AND)	Yes / No
2. LANDFORM	Presence of suitable landform (defined as Plains, 'alluvial plain or flat, flood plain' or 'inland clay pan' or 'unspecified, flat, gentle slopes, undulating terrain'; Streams, any feature; Water, any feature (excluding saltwater features). (AND)	Yes / No
3. PHYSIOGRAPHY / Soil	Presence of cracking clay soils (Vertosols, generally >30% clay; defined as 'clay loam' to 'heavy clay') and/or soil cracks (defined as > 5mm wide and 50mm deep: Scattered, Common or Abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief. (OR)	Yes / No
4. FAUNA HABITAT	Presence of habitat providing suitable shelter (e.g. leaf litter, coarse woody debris; defined as 'leaf litter depth' – multiple or deep layers or 'leaf litter coverage' – abundant or 'coarse woody debris' – abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief.	Yes / No
Grey snake habitat	**PRESENT** (Grey snake habitat present if: Items 1 and 2 are present in association with 3 and/or 4)	**ABSENT**

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
N/A					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation or soil profile disturbance
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Threatened Species core habiat possible
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No Yes / No ✓ ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes ✓	No	
Notes			

North face of ESU

East face of ESU

South face of ESU

West face of ESU

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Tetris 1-TR38	**Date:**	05 Aug 2024
Tenure:	PL1040	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	299696
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6964748
☐ Monitoring	☐ Pipeline	**Datum**	GDA2020, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 19		#	
East	# 20		#	
South	# 21		#	
West	# 22		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain ✓
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%) ✓	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW ✓	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale ✓	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’ ✓	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent ✓	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate ✓	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent ✓	**Time since**	Recent ✓	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ✓	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2 ✓		S1		S2		G			
Avg height (m) of EDL	6				**Avg DBH (cm) of EDL**		20					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse) ✓		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse ✓		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below	Not Found On Site ✓

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	317 NW	Start Easting	299708			End Easting	299686						
		Start Northing	6964726			End Northing	6964773						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			9	15	2	8			1	2	0.1	1.0	
Canopy cover (%)			10		20				5		5		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus moluccana		11		11				
Allocasuarina luehmannii		37			20		7	10
Callitris glaucophylla		14		1	9		4	
Melaleuca decora		9			9			
Pomax umbellata								
Eragrostis elongata								
Aristida calycina								
Calotis cuneifolia								
Lomadra leucocephala								
Fimbristylis dichotoma								
Cheilanthes sieberi								
Bidens pilosa								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	23	24	25	26	27	
Native perennial grass	30	30	30	20	30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)			10		10	
Native shrubs (<1m)					20	
Non-native grass						
Non-native forbs and shrubs						
Litter	10	20	10	20	10	
Rock						
Bare ground	60	50	50	60	30	
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.20	N/A	LC	NCAP
Survey result	11.5.20	N/A	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	0	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common ✓	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common ✓	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common ✓	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered ✓	Common	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Coarse woody debris	Absent ✓	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered ✓	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	N/A	**No. of trees with hollows (>30cm)**	N/A

GREY SNAKE habitat suitability analysis (Grey snake habitat must have the presence of suitable land use, landform, and micro-habitat features within 50 m of freshwater)		
1. LAND USE	No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks). (AND)	Yes / No
2. LANDFORM	Presence of suitable landform (defined as Plains, 'alluvial plain or flat, flood plain' or 'inland clay pan' or 'unspecified, flat, gentle slopes, undulating terrain'; Streams, any feature; Water, any feature (excluding saltwater features). (AND)	Yes / No
3. PHYSIOGRAPHY / Soil	Presence of cracking clay soils (Vertosols, generally >30% clay; defined as 'clay loam' to 'heavy clay') and/or soil cracks (defined as > 5mm wide and 50mm deep: Scattered, Common or Abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief. (OR)	Yes / No
4. FAUNA HABITAT	Presence of habitat providing suitable shelter (e.g. leaf litter, coarse woody debris; defined as 'leaf litter depth' – multiple or deep layers or 'leaf litter coverage' – abundant or 'coarse woody debris' – abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief.	Yes / No
Grey snake habitat	**PRESENT** (Grey snake habitat present if: Items 1 and 2 are present in association with 3 and/or 4)	**ABSENT**

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
None					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation or soil profile disturbance
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Threatened species possible core habitat
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No Yes / No ✓ ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes ✓	No	
Notes			

North face of ESU

East face of ESU

South face of ESU

West face of ESU

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Tetris 1-TR39	**Date:**	05 Aug 2024
Tenure:	PL1040	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	298947
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6964895
☐ Monitoring	☐ Pipeline	**Datum**	GDA2020, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 28		#	
East	# 29		#	
South	# 30		#	
West	# 31		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain ✓
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%) ✓	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W ✓	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale ✓	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’ ✓	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent ✓	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate ✓	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent ✓	**Time since**	Recent ✓	Old	**Average Height (m)**	7				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ✓	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1	T2 ✓	S1	S2	G							
Avg height (m) of EDL	3			**Avg DBH (cm) of EDL**	10							
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense) ✓	10-30% (sparse)	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense ✓	Sparse	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below	Not Found On Site ✓

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	254 W		Start Easting	298953			End Easting	298944					
			Start Northing	6964923			End Northing	6964869					
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			9	15	2	6			1	2	0.1	1	
Canopy cover (%)			10		30				5		5		
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed										
NB: Record ground cover species within 50m x 10m transect			E		T1		T2		T3		S1		S2
		TOTALS											
Eucalyptus crebra		15			15								
Allocasuarina luehmannii		35					20				15		
Acacia decora		20									20		
Acacia glaucocarpa		4					4						
Acacia spectabilis		4									4		
Cheilanthes sieberi													
Aristida calycina													
Calotis cuneifolia													
Eragrostis elongata													
Lomadra leucocephala													
Gahnia aspera													

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	32	33	34	35	36	
Native perennial grass	40	10	20	40	30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	30					
Native shrubs (<1m)			30			
Non-native grass						
Non-native forbs and shrubs						
Litter	20	80	30	50	20	
Rock						
Bare ground	10	10	10	10	30	
Cryptogams			10		20	
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1	N/A	LC	NCAP
Survey result	11.5.1 Regrowth	N/A	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	No. Vegetation community floristic match with remnant RE 11.5.1, but it fail on structure. Due that it is classifies as regrowth approx 10 years.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	0	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common ✓	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common ✓	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant ✓
Large Eucalypts (>30cm DBH)	Absent	Scattered ✓	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent ✓	Scattered	Common	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Coarse woody debris	Absent ✓	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent ✓	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	N/A	**No. of trees with hollows (>30cm)**	N/A

GREY SNAKE habitat suitability analysis (Grey snake habitat must have the presence of suitable land use, landform, and micro-habitat features within 50 m of freshwater)		
1. LAND USE	No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks). (AND)	Yes / No
2. LANDFORM	Presence of suitable landform (defined as Plains, 'alluvial plain or flat, flood plain' or 'inland clay pan' or 'unspecified, flat, gentle slopes, undulating terrain'; Streams, any feature; Water, any feature (excluding saltwater features). (AND)	Yes / No
3. PHYSIOGRAPHY / Soil	Presence of cracking clay soils (Vertosols, generally >30% clay; defined as 'clay loam' to 'heavy clay') and/or soil cracks (defined as > 5mm wide and 50mm deep: Scattered, Common or Abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief. (OR)	Yes / No
4. FAUNA HABITAT	Presence of habitat providing suitable shelter (e.g. leaf litter, coarse woody debris; defined as 'leaf litter depth' – multiple or deep layers or 'leaf litter coverage' – abundant or 'coarse woody debris' – abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief.	Yes / No
Grey snake habitat	**PRESENT** (Grey snake habitat present if: Items 1 and 2 are present in association with 3 and/or 4)	**ABSENT**

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
None					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation or soil profile disturbance
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Threatend species possible core habitat
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No Yes / No ✓ ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes ✓	No	
Notes			

North face of ESU

East face of ESU

South face of ESU

West face of ESU

TR1

Ecological Field Survey

SITE IDENTIFICATION			
Site Name:	Tetrist TR31	Date:	06.08.2024
Tenure:	PL1030	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	303809
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6956807
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7690		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	(Sandy loam')	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing		Forestry		Cropping		Conservation		Mining		Other:	
Evidence	Clearing		Cultivation		Regrowth		Logging		Thinning		No disturbance	
Dieback	0%		1-25%		26-75%		>76%		n/a			
Site condition	Very good		Good		Moderate		Poor		Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	5 m				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	2				**Avg DBH (cm) of EDL**		24					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey [illegible] targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SE	Start Easting	303796	End Easting	303825
		Start Northing	6964826	End Northing	6964784

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		8 | 10	4 | 8	2 | 4	1 | 2	0.1 | 0.9
Canopy cover (%)		15	5	5	5	3

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. clavigera		23		5	8	3	2	5
Melaleuca spp		10		6	3	1		
Eucalypt		35				21	9	5
Petalostigma	pubescens	26					13	11
Eucalyptus	spp.	2		2				
Dodonaea triangularis								
Aristida caput-medusae								
Chrysocephalum apiculatum								
Panicum decompositum								
Grahnia australis								
Pomax umbellata								
Cheilanthes sieberi								

Ecological Field Survey

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) = Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7683	→	→	→	→	
Native perennial grass	5	5	5	5	5	
Native other grass (if relevant)						
Native forbs and other species (non-grass)		10	5	5	5	
Native shrubs (<1m)		10				
Non-native grass						
Non-native forbs and shrubs						
Litter	80	55	80	45	60	
Rock						
Bare ground	15	20	18	45	30	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	NA	LC	NC
Survey result	11.7.4	〃	〃	〃
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	5	No. of logs (>10cm)	3
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	100	Per hectare (x 20)	60

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR 2

Ecological Field Survey

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris1-TR32	Date:	06.08.2024
Tenure:	PL10L40	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	302958
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6964777
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7726		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)		Moderately sloping (5-10%)		Strongly sloping (11-24%)		
	Moderately steep (25-38%)	Steep (39-55%)		Very steep (56-100%)		Slope >100% (45°)		
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow		Orange		Brown		Red	
	Black	Grey		Pale		Dark		Mottled	
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'		'Loam'		'Silty loam'	
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'		'Light clay'		'Light medium clay'	
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion		Absent		Scattered				Frequent	
Erosion Type	Tunnelling	Sheet	Rill	Gully		Mass failure		Stream-bank	

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:				
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance				
Dieback	0%	1-25%	26-75%	>76%	n/a					
Site condition	Very good	Good	Moderate	Poor	Degraded					
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	4 m		
Disturbance notes										

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G
Avg height (m) of EDL	12					**Avg DBH (cm) of EDL**			22		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	302958			End Easting	302946				
		Start Northing	6964800			End Northing	6964758				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)	1	5	14	1		2	6	1	2	0.1	0.9
Canopy cover (%)		15				5		5		3	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. grandiflorum		1		1				
E. erythr		2					2	
Melaleuca spp.		3						3
Eucalyptus		22		8		5	9	
E. clivicola		12		3		3	1	5
Acacia retinodes		2					2	
Acacia spp.		4					4	
Pultenaea daphnoides								
Aristida caput-medusae								
Cheilanthes sieberi								
Chrysocephalum apiculatum								
Dianella spp.								
Lomandra patens								
Entolasia stricta								
Tricoryne elatior								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7721	→	→	→	→	
Native perennial grass	10	5	5	10	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	15	5		10	20	
Native shrubs (<1m)			15			
Non-native grass	5					
Non-native forbs and shrubs						
Litter	45	30	60	50	40	
Rock						
Bare ground	25	10	20	30	30	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (30)	11.7.4	NA	LC	NC
Survey result	11.7.4 Regrowth	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES, but it regrowth			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	1	Total length of logs (>10cm)	7	No. of logs (>10cm)	5
Per hectare (x 20)	x	Per hectare (x 20)	20	Per hectare (x 20)	140	Per hectare (x 20)	100

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops		Absent	Present	
Wetland / Swamp / Waterbody		Absent	Present	
Waterway		Absent	Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Scattered Ti trees. grassy scattered vegetation. Regrowth area.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TP3

Ecological Field Survey ORD ARRAYMM FOR 0067

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris 1- TR33	**Date:**	06.09.2024
Tenure:	PL1040	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	303786
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6964017
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 7742		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion		Absent	Scattered			Frequent		
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	3				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL						**Avg DBH (cm) of EDL**			16			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SE	Start Easting	283781	End Easting	283797		
		Start Northing	6964037	End Northing	6963929		
Stratum	E	T1	T2	T3	S1	S2/Seedlings	
Height range (m)	14 | 18		4 | 6	2 | 4	1 | 2	0.1	0.5
Canopy cover (%)	3		15	20	10	3	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. urabora		33	2		10	3	15	3
Lysicarpus angustifolius		34			3	1	18	12
Melaleuca		3					2	1
Calytrix glaucophylla		5					3	2
Anthocercis littorea		14					5	9
E. Chlorocalyx		18			9	3	8	3
Chrysolaena sieberi								
Avishia caput-medusae								
Pauridium decompositum								
Gahnia aspera								
Dianella caerulea								
Entolasia stricta								

Ecological Field Survey

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7737	→	→	→	→	
Native perennial grass			10		5	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	5			15	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	80	70	70	80	50	
Rock						
Bare ground	10	25	20	20	30	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (30)	11.7.4	NA	LC	NC
Survey result	11.7.4 Regrowth	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES, but it is regrowth			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	8	No. of logs (>10cm)	6
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	160	Per hectare (x 20)	120

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Vegetation looks like regrowth.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Tr 4

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris1 - TR34	Date:	06.08.2024
Tenure:	PL10 40	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	302517
☐ Pilot Well + Dam	☐ Dam	Northing (N)	6964064
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 7755		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	(W)	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	('Sandy loam')	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	5m				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	10		**Avg DBH (cm) of EDL**	22	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey

target zero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)									
Transect Start compass bearing	W	Start Easting	302539		End Easting	302125			
		Start Northing	6964058		End Northing	6964074			
Stratum	E	T1		T2		T3		S1	S2/Seedlings
Height range (m)		6	12			2	C	1 2	0·1 0·9
Canopy cover (%)		12				15		10	5

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. cyathra				3		10	15	12
Eucalyptus spp.				4		3	2	
Melaleuca spp.				4		3	51	25
Allocasuarina littoralis				2			53	25
Acacia longifolia							15	15
Acacia spp.								
Cheilanthes sieberi								
Fimbristylis dichotoma								
Chrysocephalum apiculatum								
Dianella caerulea								
Hakea sericea								
Entolasia stricta								
Aotus ericoides								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	5	5	5	5	10	
Native perennial grass						
Native other grass (if relevant)						
Native forbs and other species (non-grass)	30	30	20	40	20	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs	5			5		
Litter	40	40	40	40	40	
Rock						
Bare ground	20	25	35	10	30	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (Aout-)	11.5.1/11.5.20/11.5.4	NA	LC	NC
Survey result	11.5.1 Regrowth	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES, it is 11.5.1 Regrowth			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	23	No. of logs (>10cm)	11
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	460	Per hectare (x 20)	220

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Very fallow cleaning.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

The vegetation does not fulfill the criteria to be removed, it is regrowth

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR5

Ecological Field Survey

targetzero

SITE IDENTIFICATION			
Site Name:	Tetris7 - TR35	Date:	06.08.2024
Tenure:	PL1040	Assessor(s):	Nariu Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	303086
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6963627
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 7778	7778	#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated ~~within ESU or~~ 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	3 m				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	12				**Avg DBH (cm) of EDL**		23					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia stricta	Scattered				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SE	Start Easting	303079	End Easting	303096
		Start Northing	6963643	End Northing	6963607

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		8 | 14	4 | 8	2 | 4	1 | 2	0.1 | 0.9
Canopy cover (%)		15	5	5	10	3

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Angophora leiocarpa		3		2		1		
Banksia				5	2	3	5	
Eucalyptus		15		3	2	5	2	
Melaleuca spp.								
Callistemon glaucophyllus				16	3	5	7	5
Melaleuca spp.		65				15	29	21
Petalostigma pubescens							3	9
Panicum decompositum								
Lomandra patens								
Aristida caput-medusae								
Cheilanthes sieberi								
Entolasia stricta								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) = Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	7773	→	→	→	→	
Native perennial grass	5	5	10	10	5	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5	5		5	10	
Native shrubs (<1m)			10	10		
Non-native grass						
Non-native forbs and shrubs					10	
Litter	80	80	60	55	55	
Rock						
Bare ground	10	10	20	20	20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	NA	LC	NC
Survey result	11.7.4	〃	〃	〃
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	Y	No. of hollow logs	Y	Total length of logs (>10cm)	16	No. of logs (>10cm)	7
Per hectare (x 20)	Y	Per hectare (x 20)	Y	Per hectare (x 20)	320	Per hectare (x 20)	140

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Tetris 1-TR40	**Date:**	06 Aug 2024
Tenure:	PL1040	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	298352
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6965531
☐ Monitoring	☐ Pipeline	**Datum**	GDA2020, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	ESA Cat C
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 37		#	
East	# 38		#	
South	# 39		#	
West	# 40		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks ✓	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	Level (<1%)	Gently sloping (1-4%) ✓	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	N	S	E	W ✓	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale	Dark ✓	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**			
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’** ✓	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**			
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)					
Erosion	Absent ✓	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good ✓	Moderate	Poor	Degraded							
Fire scars	Absent ✓	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ✓	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1 ✓	T2	S1	S2	G							
Avg height (m) of EDL	10			**Avg DBH (cm) of EDL**	30							
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense) ✓	10-30% (sparse)	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse ✓	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below	Not Found On Site ✓

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	250 W		Start Easting	298324			End Easting	298377					
			Start Northing	6965539			End Northing	6965526					
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			10	19	2	9			1	2	0.1	1	
Canopy cover (%)			20		10				10		5		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus camaldulensis		25		25				
Eucalyptus moluccana		19			19			
Eucalyptus crebra		4		4				
Allocasuarina luehmannii		12			12			
Melaleuca decora		3			3			
Callitris glaucophylla		13		7	6			
Juncus polyanthemus								
Calotis cuneifolia								
Chrysocephalum apiculatum								
Maireana decalvans								
Panicum queenslandeicum								
Glanduralia aristigera								
Cymbopogon refractus								
Aristida calycina								
Gahnia aspera								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	41	42	43	44		
Native perennial grass	40	20	30	40	20	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	30	50	20	10	50	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	10	10	40	10	20	
Rock						
Bare ground	20	10	10	20	10	
Cryptogams				20		
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.3.4	N/A	OC	OC
Survey result	11.3.4	N/A	OC	OC
Agree with mapped RE? If **no**, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	5	**No. of logs (>10cm)**	2
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	100	**Per hectare (x 20)**	40

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent		Present ✓	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant ✓
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant ✓
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant ✓
Dense shrub/grass shelter	Absent	Scattered	Common ✓	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant ✓
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common ✓	Abundant
Large rocks (>30cm)	Absent✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Coarse woody debris	Absent	Scattered	Common ✓	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common ✓	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent	Scattered	Common ✓	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	N/A	**No. of trees with hollows (>30cm)**	N/A

GREY SNAKE habitat suitability analysis (Grey snake habitat must have the presence of suitable land use, landform, and micro-habitat features within 50 m of freshwater)		
1. LAND USE	No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks). (AND)	Yes / No
2. LANDFORM	Presence of suitable landform (defined as Plains, 'alluvial plain or flat, flood plain' or 'inland clay pan' or 'unspecified, flat, gentle slopes, undulating terrain'; Streams, any feature; Water, any feature (excluding saltwater features). (AND)	Yes / No
3. PHYSIOGRAPHY / Soil	Presence of cracking clay soils (Vertosols, generally >30% clay; defined as 'clay loam' to 'heavy clay') and/or soil cracks (defined as > 5mm wide and 50mm deep: Scattered, Common or Abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief. (OR)	Yes / No
4. FAUNA HABITAT	Presence of habitat providing suitable shelter (e.g. leaf litter, coarse woody debris; defined as 'leaf litter depth' – multiple or deep layers or 'leaf litter coverage' – abundant or 'coarse woody debris' – abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief.	Yes / No
Grey snake habitat	**PRESENT** (Grey snake habitat present if: Items 1 and 2 are present in association with 3 and/or 4)	**ABSENT**

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
None					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation or soil profile disturbance
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Threatened species core habitat possible
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No ✓ Yes / No ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes ✓	No	
Notes	Grey snake core habiat ESA Cat C		

North face of ESU

East face of ESU

South face of ESU

West face of ESU

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Tetris 1-TR41	**Date:**	06 Aug 2024
Tenure:	PL1040	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	302203
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6964790
☐ Monitoring	☐ Pipeline	**Datum**	GDA2020, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 45		#	
East	# 46		#	
South	# 47		#	
West	# 48		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain ✓
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%) ✓	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW ✓	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale ✓	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’ ✓	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent ✓	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate ✓	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent ✓	**Time since**	Recent ✓	Old	**Average Height (m)**	4				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ✓	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1 ✓	T2	S1	S2	G							
Avg height (m) of EDL	10			**Avg DBH (cm) of EDL**	30							
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse) ✓	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense ✓	Sparse	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below	Not Found On Site ✓

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	296 NW	Start Easting	302217			End Easting	302187						
		Start Northing	6964763			End Northing	6964810						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			9	17	2	8			1	2	0.1	1	
Canopy cover (%)			10		20				10		5		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra		11		11				
Eucalyptus moluccana		5		1	4			
Melaleuca decora		5			5			
Lysicarpus angustifoloius		22		8	9		5	
Angophora leiocarpa		4		4				
Acacia glaucocarpa		20		3	10		7	
Aristida calycina								
Hibbertia stricta								
Calotis cuneifolia								
Chrysocephalum apiculatum								
Panicum queenslandeicum								
Oxalis perennans								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	49	50	51	52	53	
Native perennial grass	20	30	20	10	20	
Native other grass (if relevant)						
Native forbs and other species (non-grass)		10				
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	10	40	70	90	70	
Rock						
Bare ground	60	20	10		10	
Cryptogams	10					
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1	N/A	LC	NCAP
Survey result	11.5.1 Regrowth	N/A	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data				

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	0	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant ✓
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant ✓
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common ✓	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common ✓	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered ✓	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent ✓	Scattered	Common	Abundant
Coarse woody debris	Absent ✓	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common ✓	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	N/A	**No. of trees with hollows (>30cm)**	N/A

GREY SNAKE habitat suitability analysis (Grey snake habitat must have the presence of suitable land use, landform, and micro-habitat features within 50 m of freshwater)		
1. LAND USE	No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks). (AND)	Yes / No
2. LANDFORM	Presence of suitable landform (defined as Plains, 'alluvial plain or flat, flood plain' or 'inland clay pan' or 'unspecified, flat, gentle slopes, undulating terrain'; Streams, any feature; Water, any feature (excluding saltwater features). (AND)	Yes / No
3. PHYSIOGRAPHY / Soil	Presence of cracking clay soils (Vertosols, generally >30% clay; defined as 'clay loam' to 'heavy clay') and/or soil cracks (defined as > 5mm wide and 50mm deep: Scattered, Common or Abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief. (OR)	Yes / No
4. FAUNA HABITAT	Presence of habitat providing suitable shelter (e.g. leaf litter, coarse woody debris; defined as 'leaf litter depth' – multiple or deep layers or 'leaf litter coverage' – abundant or 'coarse woody debris' – abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief.	Yes / No
Grey snake habitat	**PRESENT** (Grey snake habitat present if: Items 1 and 2 are present in association with 3 and/or 4)	**ABSENT**

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
None					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation or soil profile disturbance
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Threatened species core habitat possible
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No Yes / No ✓ ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes ✓	No	
Notes			

North face of ESU

East face of ESU

South face of ESU

West face of ESU

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Tetris 1-TR42	**Date:**	06 Aug 2024
Tenure:	PL1040	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	301659
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	6964330
☐ Monitoring	☐ Pipeline	**Datum**	GDA2020, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 54		#	
East	# 55		#	
South	# 56		#	
West	# 57		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain ✓
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%) ✓	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE ✓	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale ✓	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’ ✓	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent ✓	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate ✓	Poor	Degraded							
Fire scars	Absent ✓	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ✓	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1 ✓	T2	S1	S2	G							
Avg height (m) of EDL	7			**Avg DBH (cm) of EDL**	23							
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse) ✓	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense ✓	Sparse	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below	Not Found On Site ✓

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	125 SE	Start Easting	301654			End Easting	301667						
		Start Northing	6964357			End Northing	6964304						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			9	15	2	8			1	2	0.1	1.0	
Canopy cover (%)			10		20				5		5		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra		7		7				
Eucalyptus moluccana		10			10			
Angophora leiocarpa		10		10				
Lysicarpus angustifoloius		21		21				
Acacia glaucocarpa		13			7		6	
Dodonaea triangularis		33					23	10
Allocasuarina luehmannii		14					14	
Goodenia rotundifolia								
Dodonaea viscosa								
Sonchus oleraceus								
Hypochaeris radicata								
Hibbertia stricta								
Chrysocephalum apiculatum								
Gahnia aspera								
Panicum queenslandeicum								
Lomadra leucocephala								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	58	59	60	61	62	
Native perennial grass	10	30			40	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	20	20		20		
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	30	20	90	80	40	
Rock						
Bare ground	30	30	10		20	
Cryptogams	10					
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1	N/A	LC	NCAP
Survey result		N/A	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	0	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant ✓
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant ✓
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common ✓	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common ✓	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Coarse woody debris	Absent ✓	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent ✓	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	N/A	**No. of trees with hollows (>30cm)**	N/A

GREY SNAKE habitat suitability analysis (Grey snake habitat must have the presence of suitable land use, landform, and micro-habitat features within 50 m of freshwater)		
1. LAND USE	No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks). (AND)	Yes / No
2. LANDFORM	Presence of suitable landform (defined as Plains, 'alluvial plain or flat, flood plain' or 'inland clay pan' or 'unspecified, flat, gentle slopes, undulating terrain'; Streams, any feature; Water, any feature (excluding saltwater features). (AND)	Yes / No
3. PHYSIOGRAPHY / Soil	Presence of cracking clay soils (Vertosols, generally >30% clay; defined as 'clay loam' to 'heavy clay') and/or soil cracks (defined as > 5mm wide and 50mm deep: Scattered, Common or Abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief. (OR)	Yes / No
4. FAUNA HABITAT	Presence of habitat providing suitable shelter (e.g. leaf litter, coarse woody debris; defined as 'leaf litter depth' – multiple or deep layers or 'leaf litter coverage' – abundant or 'coarse woody debris' – abundant) within **50 m of freshwater** wetlands, drainage features likely to hold water for protracted periods (4-6 weeks) or gilgai microrelief.	Yes / No
Grey snake habitat	**PRESENT** (Grey snake habitat present if: Items 1 and 2 are present in association with 3 and/or 4)	**ABSENT**

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
None					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

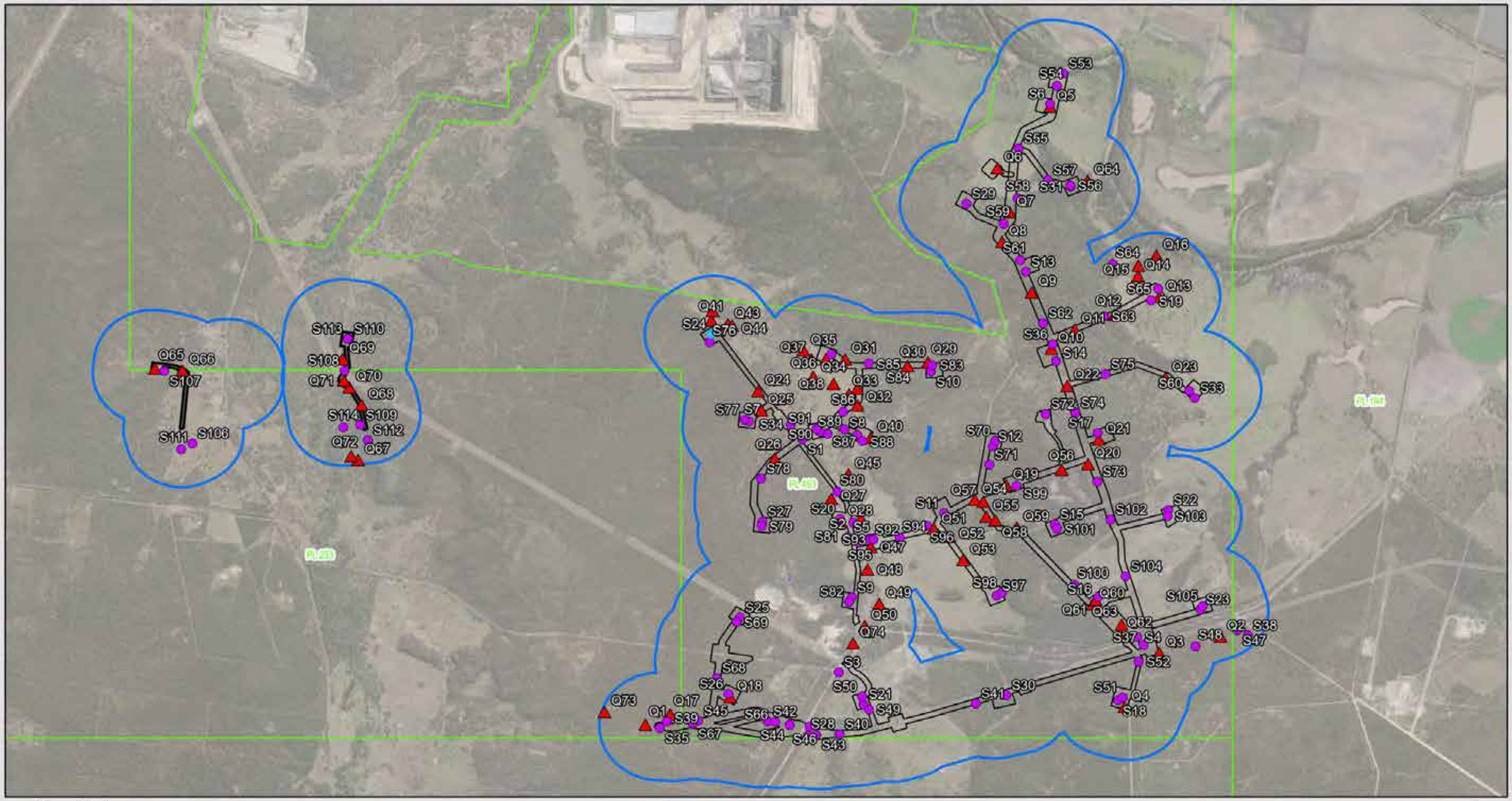
AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation or soil profile disturbance
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Threatened Species core possible habitat
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No Yes / No ✓ ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes ✓	No	
Notes			

North face of ESU

East face of ESU

South face of ESU

West face of ESU



Proposed disturbance Area

500 m buffer

Ecology Assessment

- Quaternary
- Secondary

PL493 - Wyalla Project

Source: Arrow Energy Pty Ltd
Geoscience Australia
Dept. Natural Resources and Mines

1.1 0.6 0 1.1 km

Scale: 1:38,000 **@ A3**

N

arrow energy
go further

Based on or contains data provided by the State of Queensland (Department of Natural Resources and Mines) 2016. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws

The dimensions, areas, number of lots, size & location of corridor information are approximate only and may vary.

Date: 22/10/2024 **Author:** Thiago Moura
Issued To: Department of Environment, Science and Innovation (DESI)

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Table 1 - List of the Ecology Field Surveys taken for Secondary assessment of ecological values

Map ID	File Name	Easting	Northing	RE	Date
S1	11.5.20-1	281183	7014829	11.5.20	19/01/2022
S2	Cleared-1	281656	7014000	Cleared	23/03/2022
S3	Warra Kogan Rd Intersection	281553	7012494	11.5.1a	25/06/2024
S4	Warra Kogan Rd	284234	7012897	11.7.4	25/06/2024
S5	Wyalla laydown	281611	7013856	Non-remnant	21/08/2024
S6	Wyalla 35	283357	7018235	Non-remnant	25/06/2024
S7	Wyalla 40	280700	7015000	11.5.20	26/06/2024
S8	Wyalla 24	281678	7014881	Non-remnant	26/06/2024
S9	Wyalla 38	281657	7013248	11.7.7	25/06/2024
S10	Wyalla 29	282330	7015529	HVR 11.5.1	24/06/2024
S11	Wyalla 37	282472	7014108	HVR 11.5.1	25/06/2024
S12	Wyalla 28	282901	7014788	11.5.1	24/06/2024
S13	Wyalla 33	283168	7016545	11.7.4	25/06/2024
S14	Wyalla 30	283454	7015654	Non-remnant	24/06/2024
S15	Wyalla 26	283471	7014014	11.7.4	26/06/2024
S16	Wyalla 25	283877	7013293	Non-remnant	26/06/2024
S17	Wyalla 44	283843	7014939	11.7.4 regrowth	26/06/2024
S18	Wyalla 23	284072	7012257	11.7.7	26/06/2024
S19	Wyalla 32	284300	7016279	Non-remnant	25/06/2024
S20	Wyalla 39	281538	7014035	Non-remnant	26/06/2024
S21	Wyalla 42	281780	7012176	Non-remnant	26/06/2024
S22	Wyalla 27	284491	7014174	Non-remnant	26/06/2024
S23	Wyalla 21	284799	7013181	Non-remnant	25/06/2024
S24	Wyalla 46	280348	7015870	11.7.5/11.5.20	20/08/2024
S25	Wyalla 45	280653	7013030	11.7.7	26/06/2024
S26	Wyalla 43	280564	7012259	11.7.5	26/06/2024
S27	Wyalla 41	280839	7013995	11.7.4/11.5.20	26/06/2024
S28	Wyalla HDD Pad	281288	7011854	11.5.1	21/08/2024
S29	Wyalla 49	282621	7017219	11.5.3	20/08/2024
S30	Wyalla 22	283066	7012289	11.7.7	25/06/2024
S31	Wyalla 34	283556	7017407	11.7.4	25/06/2024
S32	Wyalla 47	281431	7015685	Non-remnant	20/08/2024
S33	Wyalla 31	284710	7015306	Non-remnant	24/06/2024
S34	Wyalla EWA for WC Xing	281077	7014976	11.5.20	21/08/2024
S35	Wyalla gathering	279951	7011907	11.7.7	21/08/2024
S36	Wyalla Coms Tower	283423	7015821	HVR 11.5.3	21/08/2024
S37	Tong Park Pt 1	284293	7012814	Non-remnant	15/04/2024
S38	Tong Park Pt 2	285229	7012929	Non-remnant	15/04/2024
S39	Kogan Creek 1	280013	7011971	11.7.7	31/07/2019
S40	KNJV-T1	281571	7011873	11.5.1	30/07/2019
S41	KNJV-T2	282793	7012200	11.7.7	31/07/2019
S42	TWRP-T1	280922	7011988	11.7.7	29/04/2024
S43	TWRP-T2	281362	7011864	Cleared	23/05/2024
S44	TWRP-T3	281120	7011959	11.5.1	24/06/2024
S45	TWRP-T4	280295	7011985	11.7.7	24/06/2024
S46	TWRP-T5	281300	7011943	11.5.1a	24/06/2024
S47	TWRP-T6	285134	7012978	11.5.1	25/06/2024
S48	TWRP-T21	284760	7012810	11.5.1 Regrowth	24/06/2024
S49	WAR-KOG-RD-T1	281832	7012123	11.5.1 Regrowth	25/06/2024
S50	KOG-RD-T2	281768	7012254	Derived Grassland	31/07/2019
S51	KOG-RD-T3	284114	7012286	Cleared	14/08/2019
S52	KOG-RD-T4	284251	7012647	11.7.7	15/08/2019

S53	COND-RIVER-T1	283470	7018543	11.3.25	23/03/2022
S54	COND-T2	283416	7018418	11.3.2	23/03/2022
S55	COND-T3	283081	7017783	Grazing/Pasture	23/03/2022
S56	COND-T4	283554	7017417	11.7.7	3/08/2022
S57	COND-T5	283350	7017468	11.5.20	1/08/2019
S58	COND-T6	283080	7017282	11.3.1	13/08/2019
S59	COND-T7	282960	7017024	11.7.7	13/08/2019
S60	COND-T8	284659	7015376	11.4.3 Regrowth	14/08/2019
S61	PAST-PROP-T1	283116	7016661	11.7.4 Regrowth	16/08/2019
S62	PAST-PROP-T2	283331	7016031	11.7.7 Regrowth	16/08/2019
S63	PAST-PROP-T3	283879	7016109	11.7.7	13/08/2019
S64	PAST-PROP-T4	283950	7016634	11.4.3 Regrowth	14/08/2019
S65	PAST-PROP-T5	284362	7016395	Grazing/Pasture	14/08/2019
S66	Wyalla-T1	280988	7011985	11.5.1	22/08/2024
S67	Wyalla-T2	280248	7011958	11.7.7	9/03/2024
S68	Wyalla-T3	280456	7012415	11.7.7	17/01/2022
S69	Wyalla-T4	280624	7012984	11.7.7	17/01/2022
S70	Wyalla-T5	282923	7014844	11.5.1 Regrowth	25/01/2022
S71	Wyalla-T6	282872	7014603	11.3.25	25/01/2022
S72	Wyalla-T7	283371	7015119	11.7.5	25/01/2022
S73	Wyalla-T8	283848	7014449	11.7.7 Regrowth	25/07/2024
S74	Wyalla-T9	283640	7015138	11.7.4	31/07/2024
S75	Wyalla-T10	283903	7015530	11.7.7 Regrowth	22/08/2024
S76	Wyalla-T11	280332	7015787	11.5.20	22/08/2024
S77	Wyalla-T12	280660	7015015	11.5.20	22/08/2024
S78	Wyalla-T13	280819	7014427	11.7.7	22/08/2024
S79	Wyalla-T14	280833	7013952	11.7.7	23/08/2024
S80	Wyalla-T15	281509	7014306	11.5.1 Regrowth	23/08/2024
S81	Wyalla-T16	281594	7013836	Derived Grassland	23/08/2024
S82	Wyalla-T17	281633	7013204	11.5.20	3/09/2024
S83	Taylors-T1	282341	7015592	11.5.1 Regrowth	31/07/2019
S84	Taylors-T2	281980	7015588	11.5.1 Regrowth	26/05/2021
S85	Taylors-T3	281770	7015602	11.5.1	19/08/2021
S86	Taylors-T5	281547	7015111	Derived Grassland	15/04/2024
S87	Taylors-T6	281562	7014934	11.5.1	16/04/2024
S88	Taylors-T7	281726	7014822	Regrowth undifferentiated	15/04/2024
S89	Taylors-T8	281412	7014888	11.3.25	15/04/2024
S90	Taylors-T9	281339	7014906	11.5.1	15/04/2024
S91	Taylors-T10	281310	7014934	11.3.25 Regrowth	15/08/2019
S92	Taylors-T11	281809	7013831	11.3.25	1/08/2019
S93	Taylors-T12	281842	7013832	Regrowth undiff.	13/08/2019
S94	Taylors-T13	282078	7013852	Derived Grassland	31/07/2019
S95	Taylors-T14	281722	7013799	11.5.1 Regrowth	18/08/2020
S96	Taylors-T15	282320	7013979	11.5.1 Regrowth	18/08/2020
S97	Taylors-T16	282961	7013288	Regrowth undiff.	20/08/2020
S98	Taylors-T17	283008	7013318	11.7.4 Regrowth	25/05/2021
S99	Doobette-T1	283121	7014393	11.5.1	13/08/2019
S100	Doobette-T2	283660	7013409	11.7.4	12/08/2019
S101	Wyalla-T18	283493	7013970	11.7.4	3/09/2024
S102	Wyalla-T19	283972	7014070	11.5.1	9/03/2024
S103	Wyalla-T20	284486	7014114	Regrowth undiff.	9/03/2024
S104	Wyalla-T21	284118	7013503	Regrowth undiff.	9/03/2024
S105	Wyalla-T22	284819	7013215	Regrowth undiff.	9/03/2024
S106	Regrowth 2	275693	7014690	Non-remnant	1/08/2019

S107	Woodland 1	275427	7015413	11.5.20	25/06/2024
S108	Cleared-1	277050	7015446	Non-remnant	23/03/2022
S109	RE 11.5.1-1	277202	7014903	11.5.1	13/08/2019
S110	Wyalla 101-104	277082	7015763	Non-remnant	25/06/2024
S111	KoganCk-T9	275594	7014629	Regrowth undiff.	14/08/2019
S112	KoganCk-T19	277273	7014750	11.5.1	16/08/2019
S113	KoganCk-T20	277073	7015764	11.5.20	16/08/2019
S114	KoganCk-T21	277049	7014876	11.3.4	30/07/2019

Table 2 - List of the Ecology Field Surveys taken for Quaternary assessment of ecological values

Map ID	File Name	Easting	Northing	RE	Date
Q1	TWRP-RE15	279821	7011944	Cleared	22/05/2024
Q2	TWRP-RE18	284983	7012919	11.5.1 Regrowth	23/05/2024
Q3	TWRP-RE19	284434	7012746	11.5.1 Regrowth	23/05/2024
Q4	KOG-RD-RE1	284130	7012196	11.7.7	24/06/2024
Q5	COND-RE1	283357	7018215	Grazing/Pasture	25/06/2024
Q6	COND-RE2	282892	7017589	Grazing/Pasture	25/06/2024
Q7	COND-RE3	283009	7017150	11.7.7	25/06/2024
Q8	PAST-PROP-RE2	282948	7016848	11.7.4 Regrowth	26/06/2024
Q9	PAST-PROP-RE3	283223	7016346	11.7.7	26/06/2024
Q10	PAST-PROP-RE4	283411	7015784	11.7.7 Regrowth	26/06/2024
Q11	PAST-PROP-RE5	283619	7015979	11.7.7 Regrowth	26/06/2024
Q12	PAST-PROP-RE6	283974	7016133	11.5.20	26/06/2024
Q13	PAST-PROP-RE7	284373	7016319	Grazing/Pasture	26/06/2024
Q14	PAST-PROP-RE8	284178	7016527	11.4.3 Regrowth	26/06/2024
Q15	PAST-PROP-RE9	284179	7016632	11.4.3 Regrowth	26/06/2024
Q16	PAST-PROP-RE10	284340	7016735	11.4.3 Regrowth	26/06/2024
Q17	Wyalla-RE1	280042	7012053	11.7.7	24/06/2024
Q18	Wyalla-RE2	280580	7012235	11.7.5	24/06/2024
Q19	Wyalla-RE3	283028	7014405	11.5.1 Regrowth	25/06/2024
Q20	Wyalla-RE4	283760	7014631	Derived grassland	25/06/2024
Q21	Wyalla-RE5	283854	7014879	11.7.7 Regrowth	25/06/2024
Q22	Wyalla-RE6	283560	7015415	Derived grassland	25/06/2024
Q23	Wyalla-RE7	284442	7015509	11.7.7 Regrowth	25/06/2024
Q24	Wyalla-RE8	280777	7015312	11.5.20	26/06/2024
Q25	Wyalla-KS5	280810	7015120	11.5.20	26/06/2024
Q26	Wyalla-RE9	280938	7014638	11.5.20	26/06/2024
Q27	Wyalla-RE10	281454	7014242	11.5.20	26/06/2024
Q28	Wyalla-RE11	281546	7014014	Derived grassland	26/06/2024
Q29	Taylors-RE1	282301	7015628	Undifferentiated Regrowth	20/08/2024
Q30	Taylors-RE2	282119	7015589	11.5.1 Regrowth	20/08/2024
Q31	Taylors-RE3	281554	7015644	11.5.1	20/08/2024
Q32	Taylors-RE4	281675	7015187	11.5.1 Regrowth	21/08/2024
Q33	Taylors-RE5	281596	7015296	11.5.1	21/08/2024
Q34	Taylors-RE6	281271	7015467	11.3.25	21/08/2024
Q35	Taylors-RE7	281178	7015730	11.3.2	21/08/2024
Q36	Taylors-RE8	281381	7015644	Derived Grassland	21/08/2024
Q37	Taylors-RE9	281251	7015638	11.3.25	21/08/2024
Q38	Taylors-RE10	281455	7015399	11.5.1 Regrowth	21/08/2024
Q39	Taylors-RE11	281669	7015355	Derived Grassland	21/08/2024
Q40	Taylors-RE12	281799	7014862	11.5.1 Regrowth	21/08/2024
Q41	Taylors-RE13	280344	7016015	11.5.1	22/08/2024
Q42	Taylors-RE14	280353	7016111	11.5.1 Regrowth	22/08/2024

Q43	Taylors-RE15	280492	7015977	11.5.1 Regrowth	22/08/2024
Q44	Taylors-RE16	280532	7015963	11.3.25	22/08/2024
Q45	Taylors-RE17	281604	7014492	11.3.25	22/08/2024
Q46	Taylors-RE18	281726	7014046	11.3.25	22/08/2024
Q47	Taylors-RE19	281818	7013766	11.3.25	22/08/2024
Q48	Taylors-RE20	281793	7013538	11.5.1 Regrowth	22/08/2024
Q49	Taylors-RE21	281905	7013195	11.3.25	22/08/2024
Q50	Taylors-RE22	281778	7012970	11.3.25	22/08/2024
Q51	Taylors-RE23	282384	7013959	Derived Grassland	23/08/2024
Q52	Taylors-RE24	282525	7013882	11.5.1 Regrowth	23/08/2024
Q53	Taylors-RE25	282653	7013650	Derived Grassland	23/08/2024
Q54	Taylors-RE26	282747	7014258	Derived Grassland	2/09/2024
Q55	Taylors-RE27	282854	7014089	11.5.1 Regrowth	2/09/2024
Q56	Doobette-RE1	283523	7014570	11.5.1	3/09/2024
Q57	Doobette-RE2	282823	7014238	11.5.1	3/09/2024
Q58	Doobette-RE3	282935	7014053	11.5.1	3/09/2024
Q59	Doobette-RE4	283130	7013984	11.5.1	3/09/2024
Q60	Doobette-RE5	283826	7013224	11.7.4	3/09/2024
Q61	Doobette-RE6	283853	7013268	Undifferentiated Regrowth	3/09/2024
Q62	Doobette-RE7	284079	7012934	11.7.4 Regrowth	3/09/2024
Q63	Doobette-RE8	284091	7013024	Undifferentiated Regrowth	3/09/2024
Q64	Doobette-RE9	283706	7017478	11.4.3 Regrowth	3/09/2024
Q65	KoganCk_RE21	275342	7015444	Regrowth Undifferentiated	25/07/2024
Q66	KoganCk_RE23	275590	7015429	Regrowth Undifferentiated	25/07/2024
Q67	KoganCk_RE37	277187	7014558	11.5.1	31/07/2024
Q68	KoganCk_RE38	277209	7015110	11.5.1	31/07/2024
Q69	KoganCk_RE39	277030	7015568	11.5.1 Regrowth	31/07/2024
Q71	KoganCk_RE41	277046	7015354	11.5.1	31/07/2024
Q72	KoganCk_RE42	277124	7014595	11.5.1	31/07/2024

A 1.1 Sheet D – Regional Ecosystem type assessment site

TWRP-RE15

Location

Site No. | **Recorder:** Thiago Moura | **Day/Date:** 21 May 2024

Purpose Extension of biodiversity values present at EFS TWRP-T15

Locality: (inc. distance/direction to nearest town) Approx 10 km southwest of Kogan, QLD.

GPS: GDA2020 Zone 56 E 0279821 N 7011944

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.3	0.1 - 1	S

Structural formation: (including height)

Cleared

Ecologically dominant layer: G

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	a	Aristida caput-medisae
G	a	Cenchrus ciliaris

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: Tertiary-early Quaternary loamy and sandy plains and plateaus

Land system:

Landform: Plain

Soils: Dark brown / Silty clay loam

Field observation and notes:

Landzone: 5

RE code changes

Existing RE code: Cleared

Proposed RE code: Cleared

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

TWRP-RE18

Location

Site No. Rea-04 Recorder: Josh Frostamo Day/Date: 23/5/24

Purpose TWRP -tong Park PL253 linked to JP-03. TWRP-RE21

Locality: (inc. distance/direction to nearest town) Kogan

GPS: Zone 56 E 0284434 N 7012746

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	8	8 - 10	M
T2	4	4 - 6	D
T3		-	
S1	2	0 - 3	D
S2		-	
G		-	

Structural formation: (including height)

Open Regrowth woodland to 10m

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
T1	C	Eucalyptus crebra
T1	A	Eucalyptus c.brosa
T1	A	Eucalyptus chloroclada.
T2	D	Acacia leiocalyx
S	D	Acacia conferta.
S	A	Acacia leiocalyx

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: flat terrain

Landform:

Soils: Sandy loam w/ some clay

Field observation and notes: poor pale sandy soils, more developed T1 than Rea-03 but same structure & composition

Landzone: 5.

RE code changes

Existing RE code: 11.5.1 Regrowth

Proposed RE code: 11.5.1 Regrowth

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

TWRP-RE19

Location

Site No. RLA 01 Recorder: Joshua Prostano Day/Date: 20/5/24

Purpose TWRP PL253 like JP-01 TWRP-T21

Locality: (inc. distance/direction to nearest town) Kogan

GPS: GDA zone Zone 56 E 0277116 N 7012854

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	10	10 - 14	20
T2	8	6 - 10	30
T3	6	4 - 6	10
S1		-	
S2		-	
G		-	

Structural formation: (including height) Open woodland to 14m

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus populnea
T1	S	Allocasuarina loupnahanii
T2	S	" "
T2	D	Callitris glaucophylla

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform: Sand plains

Soils: Grey - Brown & Dark

Field observation and notes: Mapped as alluvium looks more like weathered Sand representative of LZ5 Landzone: 5

RE code changes

Existing RE code: 11.3.4

Proposed RE code: 11.5.1

END

KOG-RD-RE1

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. Recorder: DK Day/Date: 24/6/24

Purpose ECO ASSESSMENT.

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0284199 N 7681296

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	%
T1	16 5	15 - 18	25 M
T2	11	8- 13	15 S
T3		-	
S1	4	3 - 6	10 S
S2	1 5	1 - 2	5 S
G		0.1 - 1	~80% D

Structural formation: (including height)

Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T2	D	Callitris glaucophylla
T1	S	Corymbia sp.
S1	D	Acacia leiocalyx
S2	D	Alphitonia excelsa.
G	D	Aristida caput-medusae
G	S	Lomandra sp.
G	S	Dianella sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: LZ 7

Land system:

Landform: flat sandy w/ rocky soils

Soils: sandy

Field observation and notes: E. crebra dominant w/ C. glauc sub canopy.

Landzone:

RE code changes

Existing RE code: 11.7.7

Proposed RE code: 11.7.7. Remnant.

END

Photos: 108 - 111

North

East

South

West

COND-RE 1

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. ..... Recorder: DK Day/Date: 25/6/24

Purpose ECO ASSESSMENT.

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0283356 N 7018255

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	1	0.1 - 2	D

Structural formation: (including height)

Grassland

Ecologically dominant layer: G.

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
G	C	Rapistrum rugosum
	C	Cenchrus ciliaris
	S	Medicago polymorpha
	S	Sclerolaena muricata
	S	Gomphocarpus sp.
	S	Sclerolaena sp. 2
	S	Alternanthera denticulata
	S	Glandularia aristigera

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform: Plain

Soils: Alluvial clays/sediments

Field observation and notes: Highly disturbed with weeds

Landzone: 3

RE code changes

Existing RE code: Cleared - non-remnant

Proposed RE code: Cleared - "

END

Photos: 140 - 143

North

East

South

West

COND-RE2

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. ..... Recorder: DK ..... Day/Date: 25/6/24

Purpose ECO ASSESSMENT

Locality: (inc. distance/direction to nearest town) .....

GPS: Zone 56 E 0282892 N 7017589

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.5	0.1- 1	D

Structural formation: (including height)

Grassland

Ecologically dominant layer:

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
G	D	Dichanthium sericeum
	S	Rapistrum rugosum
		Medicago polymorpha
		Glandularia aristigera
		Cenchrus ciliaris
		Portulaca pilosa

Geology, landform, soils

Geology map/scale/year: .....

Geology code and rock types: .....

Land system: Flood plain

Landform: .....

Soils: .....

Field observation and notes: Acacia ~~stenoc~~ melvillei & Acacia harpophylla in adjacent, man-made drainage ditch. Landzone: 3

RE code changes

Weed dominant.

Existing RE code: Cleared – non-remnant

Proposed RE code: " "

END

Photos: 175-178

North

East

South

West

COND-RE-3

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. ____ Recorder: DK Day/Date: 25/6/24

Purpose ECO ASSESSMENT

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0283009 N 7017150

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E		-	
T1	20	18 - 22	S
T2		-	
T3		-	
S1	4.5	4 - 6	S
S2	1.5	1 - 2	S
G		-	

Structural formation: (including height)

Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
S1	C	Alphitonia excelsa
S2	D	Carissa ovata
S1	C	Jasminum didymum
S1	C	Geijera parviflora
S1	C	Alectryon diversifolius

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform: sloping into scarp

Soils: Sandy – well weathered

Field observation and notes: Eucalyptus crebra dominant. Point of transition.

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.7 → Remnant

END

Refer COND-T7

Photos: 190-193.

North

East

South

West

PAST-PROP-RE2

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. Recorder: DK Day/Date: 26/6/24

Purpose ECO ASSESSMENT

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0282747 N 7016848

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E		-	
T1	13	12 - 14	5 - 15%
T2		-	
T3		-	
S1	4	2 - 6	M
S2		-	
G		-	

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	S	Eucalyptus exserta
T1	S	Corymbia sp.
S1	D	Acacia leiocalyx
G	S	Digitaria sp.
↓	S	Brachyscome sp
	D	Aristrachne uncinulata
	S	Cyanthillium cinereum
	S	Aristida sp

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: 7 to gently sloping

Landform: flat duricrust

Soils: sandy, highly weathered.

Field observation and notes: Depauperate. Looks to have recently been affected by dieback or fire.

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4 Regrowth.

END

Photos: 220 - 223

North

East

South

West

PAST - PROP - RE3

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. ____ Recorder: DK Day/Date: 26/6/24

Purpose ECO ASSESSMENT

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0283223 N 7616346

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	16	15 - 19	25% S
T2	10	7 - 13	15% S
T3		-	
S1	4.5	3 - 6	25% S
S2		-	
G	0.5	0.1 - 1	

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum; ***d*** – dominant; ***c*** – co-dominant; ***s*** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T2	C	Melaleuca sp. 1
T2	C	" sp. 2
T2	C	Allocasuarina leuhmanii
S1	D	Acacia leiocalyx.
S1	S	Capparis arborea
G	D	Poaceae sp.
↓	↓	Aristida caput-medusae
		Cymbopogon refractus
		Setaria sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform: Gently sloping

Soils: Sandy

Field observation and notes: Mature woodland.

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.7 Remnant

END

Photos: 241 - 244

North

East

South

West

PAST - PROP - RE4

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. ___ Recorder: DK Day/Date: 26/6/24

Purpose ~~RE~~ ECO ASSESSMENT

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0263411 N 7015784

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	17	16 - 19	~10% V
T2	10	8 - 13	~10% V
T3		-	
S1	3	2 - 4	~20% S
S2		-	
G		-	

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d = dominant; *c* = co-dominant; *s* = subdominant, *a* = associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra/fibrosa
T2	D	Corymbia sp.
S1	D	Acacia leiocalyx
↓	S	Santalum lanceolatum
↓	S	Geijera parviflora
G	D	Aristida caput-medusae
↓	S	Pimelea neo-anglica
↓	↓	Nyssanthes sp
↓	↓	Solanum parvifolium
↓	↓	Lepidosperma laterale
T2	D	Allocasuarina leuhanii

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform: Flat / very gently sloping

Soils: Sandy

Field observation and notes: Sparse → likely thinned.

Landzone: 7

RE code changes

Existing RE code: Cleared

Proposed RE code: 11.7 **11.7.7 Regrowth**

END

Photos: 254 - 257

North

East

South

West

PAST - PROP - RES

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. ____ **Recorder:** DK **Day/Date:** 26/6/24

Purpose ECO ASSESSMENT

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0283618 N 7015978

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E		-	
T1	17	16 - 20	10% S
T2	10	8 - 12	10% S
T3		-	
S1	3	2 - 4	10% S
S2		-	
G		0.1 - 1	

Structural formation: (including height)

Ecologically dominant layer:

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	S	Corymbia sp.
T2	D	Allocasuarina luehmanii
S1	C	Geijera parviflora
S1	C	Capparis sp.
G	D	Aristida caput-medusae
	S	Pimelea neo-anglica
	S	Carissa ovata

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform: Gently sloping

Soils: Sandy

Field observation and notes: Sparse. thinned regrowth - larger mature trees.

Landzone: 7

RE code changes

Existing RE code: non-remnant (cleared)

Proposed RE code: **11.7.7 Regrowth**

END

Photos: 258 - 261

North

East

South

West

PAST - PROP - REG.

A 1.1 Sheet D - Regional Ecosystem type assessment site

Location

Site No. ___ Recorder: DK Day/Date: 26/6/24

Purpose ECO ASSESSMENT

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0283979 N 7016133

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	20	18 - 23	25% S
T2	14	12 - 15	15% S
T3		-	
S1	4.5	3 - 6	20% S
S2		-	
G	0.5	0.1 - 1	40%

Structural formation: (including height)
Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; **c** – co-dominant; **s** - subdominant, **a** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus woollsiana
T2	S	E. crebra
T2	S	Casuarina cristata.
S1	S	Geijera parviflora
S1	S	Psydrax odorata
G		Carissa ovata
↓		Nyssanthes sp.
		Teliercum junceum
		Jasminum didymum

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform: gently sloping hill -> eastern aspect.

Soils: sandy

Field observation and notes: E woollsiana dominant woodland with some encroaching vine thicket species.

Landzone: 5

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.5.20 Remnant.

END

Photos: 271-274

North

East

South

West

PAST - PROP - RE7

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. ___ Recorder: DK Day/Date: 26/6/24

Purpose ECO ASSESSMENT.

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0284372 N 7016319

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E		-	
T1	7	-	10%
T2	3	2 - 4	20%
T3		-	
S1		-	
S2		-	
G		-	

Structural formation: (including height)
Sparse shrubby woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	C	Acacia harpophylla
T1	C	Casuarina cristata.
G	C	Panicum coloratum
	C	Cenchrus ciliaris
	S	Carissa ovata
↓	S	Calotis cuneata

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform: undulating rises.

Soils: mix of basalt derived clays & alluvium

Field observation and notes: Sparse brigalow. weed cover greater than 50%:

Landzone: 4

RE code changes

Existing RE code: cleared

Proposed RE code: cleared

END

Photos 275-278

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site – PAST-PROP-RE8

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 26/06/2024

Purpose Ecology assessment

Locality: (inc. distance/direction to nearest town) _____

GPS: Zone 56 E 0284177 N 7016529

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	8	6-10	20%
T2	4	2-6	10%
T3		-	
S1	1.5	1-2	10%
S2		-	
G		-	

Structural formation: (including height)

Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	C	*Acacia harpophylla*
T1	C	*Casuarina cristata*
S1	-	*Capparis arborea*
G	D	*Panicum coloratum*
G	S	*Cenchrus ciliaris*
G	S	*Carissa ovata*
G	S	*Calotis cuneata*

Geology, landform, soils

Geology map/scale/year: _____

Geology code and rock types: _____

Land system: _____

Landform: Plains

Soils: Clay

Field observation and notes: Weedy grass cover greater that 50%.

Landzone: 4

RE code changes

Existing RE code: Cleared (non-remnant).

Proposed RE code: Regrowth 11.4.3.

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site – PAST-PROP-RE9

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 26/06/2024

Purpose Ecology assessment

Locality: (inc. distance/direction to nearest town) _____

GPS: Zone 56 E 0284178 N 7016632

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	18	16-25	25%
T2	12	10-14	15%
T3		-	
S1	5	3-6	15%
S2		-	
G	1.5	0.1-2	

Structural formation: (including height)

Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	C	*Acacia harpophylla*
T1	S	*Casuarina cristata*
S1	-	*Geijera parviflora*
G	D	*Panicum coloratum*
G	S	*Calotis cuneata*

Geology, landform, soils

Geology map/scale/year: _____

Geology code and rock types: _____

Land system: _____

Landform: Undulating with drainage features/gullies

Soils: Clay/Basalt

Field observation and notes: Weedy grass cover very high. Photos 292-295.

Landzone: 4

RE code changes

Existing RE code: 11.4.3

Proposed RE code: Regrowth 11.4.3.

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site – PAST-PROP-RE10

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 26/06/2024

Purpose Ecology assessment

Locality: (inc. distance/direction to nearest town) _____

GPS: Zone 56 E 0284340 N 7016735

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	18	16-25	25%
T2	12	10-14	15%
T3		-	
S1	5	3-6	15%
S2		-	
G	1.5	0.1-2	

Structural formation: (including height)

Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	C	*Acacia harpophylla*
T1	S	*Casuarina cristata*
S1	-	*Geijera parviflora*
G	D	*Panicum coloratum*
G	S	*Calotis cuneata*

Geology, landform, soils

Geology map/scale/year: _____

Geology code and rock types: _____

Land system: _____

Landform: Undulating with drainage features/gullies

Soils: Clay/Basalt

Field observation and notes: Weedy grass cover very high. Photos 292-295.

Landzone: 4

RE code changes

Existing RE code: 11.4.3

Proposed RE code: Regrowth 11.4.3.

END

North

East

South

West

RE1

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Nyalla - RE1

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 24.07.2024

Purpose Ecology Site Assessment

Locality: (inc. distance/direction to nearest town) Kogan

GPS: Zone 56 E 0280412 N 7012053

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	14 - 16	S
T2	7	6 - 8	V
T3		-	
S1	1·5	1 - 2	V
S2		-	
G	0·5	01 - 09	M

Structural formation: (including height) Woodland (15m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. fibrosa
T1	c	Acacia shirleyi
T1	a	Angophora leiocarpa
S1	a	Acacia leiocalyx
S1	a	Acacia concenta
a	a	Ghania aspera
G	s	Entolasia stricta
a	a	Dianella spp.
G	a	Aristida caput-medusae
G	a	Lomandra longifolia

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland.

Landform: Floodplain

Soils: Sandy loam

Field observation and notes: Site condition: good, no soil cracks, photos: 6412-15

Landzone: 7

RE code changes

Existing RE code: 11.7.7

Proposed RE code: 11.7.7

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 2

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Wyalla-RE2

Site No.	**Recorder:** Nazim Uddin	**Day/Date:** 24 OCT 2024	
Purpose	Ecology site Assessment		
Locality: (inc. distance/direction to nearest town)	Kogan		
GPS:	Zone 56 E 0280580	N 7611235	

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	11	10 - 12	✓
T1	8	6 - 10	✓
T2	5	4 - 6	✓
T3	3	2 - 4	S
S1	1.5	1 - 2	S
S2		-	
G	0.5	0.1 - 0.5	M

Structural formation: (including height) Shrubland. (3m)

Ecologically dominant layer: T3

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; ***s*** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
E	a	E. exserta
T1	c	Acacia shirleyi
T2	d	Lysicarpus angustifolius
T3	d	Acacia leiocalyx
S	a	Acacia conferta
G	a	Eutolasia stricta
G	a	Aristida conjunct-modulosa
G	a	Ghania aspera
G	a	Dianella spp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woody shrublands.

Landform: Flood plain

Soils: Sandy loam

Field observation and notes: Woody shrublands, mainly Acacia leiocalyx photos. 6420-23 **Landzone:** 7

RE code changes

Existing RE code: 11.7.7 (3D); 11.7.4/11.7.7/11.7.5 (Govt. Map)

Proposed RE code: 11.7.5

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE ①

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Wyalla-RE3

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 25.06.2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0283028 N 7014405

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	9	8 - 10	M
T2	5	4 - 6	S
T3	3	2 - 4	V
S1	1.5	1 - 2	V
S2		-	
G	0.5	0.1 - 0.9	S

Structural formation: (including height) Woodland (9m)

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; ***s*** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	Casuarina Luehmannii
T1	a	E. Spp
T2	c	Casuarina Luehmannii
T3	s	Casuarina Luehmannii
S1	a	Acacia leiocalyx
G	a	Brachiaria caerulea
G	a	Panicum coloratum
G	a	Fimbristylis dichotoma
G	a	Aristida capiat-meAugae
G	a	Cheilanthes sieberi

Aphis Spicata

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Alluvial floodplain (gently undulating)

Soils: Sandy loam

Field observation and notes: scattered soil cracks, regrowth alluvial flood plain, moderate condition

Landzone: 05

Photos: 6511-14

RE code changes

Existing RE code: 11.5.1 Regrowth

Proposed RE code: 11.5.1 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Needs to fill (RE 2)

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Wyalla RE-4

Site No. ____ **Recorder:** Nazim Uddin **Day/Date:** 25.06.2024

Purpose Ecological site Assessment.

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0283760 N 7019631

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E	13	12 - 14	
T1		-	
T2		-	
T3		-	
S1	1·5	1 - 2	
S2		-	
G	0·5	01 - 09	

Structural formation: (including height) Grassland.

Ecologically dominant layer: G

Plant species

Record relative (numerical) dominance for each stratum; ***d*** = dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** = associated.

Str.	Rel. dom.	Scientific Name
S1	a	Callitris glaucophylla
S1	a	Melaleuca leucadendra
E	a	E. crebra
S1	a	Acacia harpophylla
G	d	Panicum decompositum
G	d	Dichanthium sericeum
G	d	Chrysopogon fallax
G	d	Fimbristylis dichotoma
G	d	Melinis repens
G	d	Panicum spp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Flinders Grasslands.

Landform: Alluvial floodplain

Soils: Sandy loam

Field observation and notes: Alluvial floodplain, no soil cracks, grassland, Photos: 6533-35 **Landzone:** 05

RE code changes

Existing RE code: Non-remnant

Proposed RE code: Non-remnant (derived grassland)

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 3

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Kyalla – RE 5

Site No.	**Recorder:** Nazim Uddin	**Day/Date:**	25.06.2024
Purpose	Ecological site assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0283854	N 7014879	

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	16	14 - 18	✓
T1		-	
T2	5	4 - 6	✓
T3	3	2 - 4	S
S1	1·5	1 - 2	M
S2	0·7	0·5 - 1	S
G	0·3	0·1 - 0·4	M

Structural formation: (including height) Woodland

Ecologically dominant layer: T3

Plant species

Record relative (numerical) dominance for each stratum; ***d*** – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
E	a	E. fibrosa
T2	a	E. fibrosa
T3	d	Acacia leiocalyx
S1	a	" "
G		Enteleia arcuata
G		Aristida spp.
G		Fimbristylis dichotoma
G		Aristida spp.
G		Solanum parvifolium

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland.

Landform: Alluvial floodplain

Soils: Sandy loam

Field observation and notes: Regrowth area with mainly Acacia leiocalyx, no surface rock, moderate condition **Landzone:** 07

RE code changes

Existing RE code: Non-RE

Proposed RE code: 11.7.7. (Regrowth)

END

photos: 6553 – 56

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Nyamia - RE6

Site No.	**Recorder:** Nazim Uddin	**Day/Date:**	25.06.2024
Purpose	Ecological site Assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0283560 N 7015415		

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.4	01 - 07	D

Structural formation: (including height) Grassland

Ecologically dominant layer: G

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G		Entolasia stricta.
G		Panicum decompositum
G		Fimbristylis dichotoma
G		Cheilanthes sieberi
G		Heteropogon contortus
G		Aristida caput-medusae
G		Paspalidium distans
G		Ancistrachne uncinulata
G		Glandularia aristigera
G		Eragrostis spp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Grassland.

Landform: Floodplain

Soils: Sandy clay loam.

Field observation and notes: Grassland area, scattered soil cracks

Sa: Photos: 6568-71 **Landzone:**

RE code changes

Existing RE code: Non-rem (30)

Proposed RE code: Non-rem (derived grassland)

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 4

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Wyalla-RE7

Site No. **Recorder:** Nazim Uddin **Day/Date:** 25.06.2024

Purpose Ecological Site Assessment.

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0289442 N 7015509

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E	11	10 - 12	✓
T1		-	
T2		-	
T3	3	2 - 4	
S1		-	
S2		1 - 2	
G		0.1 - 0.8	

Structural formation: (including height) Woodland.

Ecologically dominant layer: T3

Plant species

Record relative (numerical) dominance for each stratum; ***d*** – dominant; ***c*** – co-dominant; ***s*** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
E	a	Eucalyptus crebra.
E1	a	Eucalyptus spp.
T3	d	Acacia confertа (S2)
T3	c	Acacia leiocalyx (S2)
T3	c	Acacia spp. (S2)
G	s	Aristida sp.
G	s	Aristida spp.
G	s	Panicum decompositum
G	s	Melinis repens
G	s	Enchrus ciliaris
G	s	Chloris gayana
G	s	Heteropogon sieberi

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Grassy-shrubby woodland.

Landform: Alluvial floodplain.

Soils: Sandy loam

Field observation and notes: ground layer is dominated by grass, sandy loam soil, poor condition **Landzone:** 07.

Photos: 6586-89

RE code changes

Existing RE code: Non-remnant

Proposed RE code: 11.7.7 Regrowth

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 1

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Wyalla_RE8

Site No. **Recorder:** Nazim Uddin **Day/Date:** 26.06.2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 5 6 E 0 2 8 0 7 7 7 N 7 0 1 5 3 1 2

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E	13	12 - 14	✓
T1	9	8 - 10	S
T2	7	6 - 8	M
T3	3	2 - 4	S
S1	1·5	1 - 2	S
S2		-	
G	0·4	0·1 - 0·7	✓

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum; *d* – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
E	a	E. populnea / E. crebra.
E	a	A. leiocarpa.
T1	d	Allocasuarina leuhmannii
T2	c	"
T3	s	"
S1	a	Acacia leiocalyx
S1	a	Acacia conferta
S1	a	Allocasuarina luehmannii
G	a	Aristida caput-medusae
G	a	Gahnia aspera.
G	a	[illegible] tomentosa.
G	a	Dianella caerulea, Fimbristylis dichotoma
		Entolasia stricta.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland

Landform: Flat to gently undulating

Soils: Sandy loam

Field observation and notes: Allocasuarina dominated woodland, no soil creek, Photos: 6621-24

Landzone: 05

RE code changes

Existing RE code: 11.5.20

Proposed RE code: 11.5.20

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 3

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Wya 4 – RE 10

Site No. ..... **Recorder:** Nazim uddin **Day/Date:** 26.06.2024

Purpose Ecological site Assessment.

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0281454 N 7014242

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D.M.S.V)
E		-	
T1	16	14 - 18	S
T2	9	8 - 10	S
T3	4	2 - 6	S
S1	1·5	1 - 2	S
S2		-	
G	0·4	0·1 - 0·7	S

Structural formation: (including height)

Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. woollsiana
T1	a	E. papuana
T2	c	Corymbia leichhardtii
T3	a	Corymbia "
S1	a	Acacia conferta
S1	a	Acacia spp.
S1	a	Acacia holocalyx
G	a	Bothriochloa decompositum
G	a	Chloris ventricosa
G	a	Aristida caput-medusae
G	a	Dichanthium sericeum

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodlands

Landform: Flat to gently undulating plain

Soils: Sandy loam

Field observation and notes: E. woollsiana dominated woodland, no soil cracks

Landzone: 05

Photos: 6700-6703

RE code changes

Existing RE code: 11.5.20

Proposed RE code: 11.5.20

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RE 4

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Wyalla - RE 11

Site No.	**Recorder:** Nazim Uddin	**Day/Date:** 26.06.2024	
Purpose	Ecological site Assessment		
Locality: (inc. distance/direction to nearest town)			
GPS:	Zone 56 E 0281514	N 7914014	

Vegetation structure
Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	1.5	1 - 2	V
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.4	01 - 07	M

Structural formation: (including height) Grassland.

Ecologically dominant layer: G

Plant species
Record relative (numerical) dominance for each stratum;
d = dominant; *c* = co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
E	a	Allocasuarina luehmannii
G	a	Calandrinia aristigera
G	a	Chelanthes sieberi
G	a	Panicum decompositum
G	a	Fimbristylis dichotoma
G	d	Aristida calycina
G	s	Sclerolaena birchii
G	a	Opuntia stricta
G	a	Eragrostis Spp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Grassland.

Landform: Alluvium floodplains

Soils: Sandy clay loam

Field observation and notes: Grassland with common soil rock

Photos: 6717-20

Landzone: 05

RE code changes

Existing RE code: Non-remnant (3D)

Proposed RE code: Non-remnant (Derived grassland)

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 20/08/2024

Purpose Vegetation survey – Taylors-RE1

Locality: (inc. distance/direction to nearest town) 10 km north of Kogan

GPS: Zone 56 E 0282301 N 7015628

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	10m	10-10	2%
T1	3m	2-4	30%
T2		-	
T3		-	
S1		-	
S2		-	
G		-	

Structural formation: (including height)

Shrubland 3 m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
E	D	Eucalyptus tereticornis
T1	D	Acacia loroloba
T1	S	Acacia leiocalyx
T1	S	Allocasuarina luehmannii
T1	S	Eucalyptus populnea
G	D	Aristida caput-medusae
G	S	Aristida sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 358-361. Undifferentiated regrowth dominated by Acacias.

Landzone: 5

RE code changes

Existing RE code: 11.5.1 Regrowth

Proposed RE code: Undifferentiated Regrowth

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 20/08/2024

Purpose Vegetation survey – Taylors-RE2

Locality: (inc. distance/direction to nearest town) 10 km north of Kogan

GPS: Zone 56 E 0282119 N 7015589

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	12	10-14	20%
T1		-	
T2		-	
T3		-	
S1		-	
S2	2	2-3	5%
G		-	

Structural formation: (including height)

Woodland 12m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus populnea
T1	S	Eucalyptus tereticornis
T1	S	Callitris glaucophylla
T1	S	Allocasuarina luehmannii
S2	D	Acacia leiocalyx
G	D	Aristida caput-medusae
G	S	Lomandra sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Sandy plains

Landform:

Soils:

Field observation and notes: Photos 371-374. Canopy height bordering on becoming remnant in this location

Landzone: 5

RE code changes

Existing RE code: 11.5.1 Regrowth

Proposed RE code: 11.5.1 Regrowth

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 20/08/2024

Purpose Vegetation survey – Taylors-RE3

Locality: (inc. distance/direction to nearest town) 10 km North of Kogan

GPS: Zone 56 E 0281554 N 7015644

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	17	15 - 19	30 %
T2	10	7 - 12	5 %
T3		-	
S1		-	
S2	1.5	1- 2	5 %
G		-	

Structural formation: (including height)

Woodland - 17 m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus populnea
T2	D	Callitris glaucophylla
S2	D	Acacia loroloba
G	D	Aristida caput-medusae
G	S	Lomandra sp.

Geology, landform, soils

Geology map/scale/year: _____

Geology code and rock types: _____

Land system: _____

Landform: _____

Soils: Loamy, sand type soils

Field observation and notes: Photos 393-396. Remnant Poplar Box dominant woodland.

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 21/08/2024

Purpose Vegetation survey – Taylors-RE4

Locality: (inc. distance/direction to nearest town) 10 km north of Kogan

GPS: Zone 56 E 0281675 N 7015187

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	15m	15-15	2%
T1	9m	7-11	30%
T2		-	
T3		-	
S1	4m	3-6	10%
S2	1.5m	1-2	5%
G		-	

Structural formation: (including height)

Woodland 9m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
E	D	Eucalyptus populnea
T1	D	Allocasuarina luehmannii
T1	S	Eucalyptus tereticornis
S1	D	Acacia loroloba
S2	S	Pimelea neo-anglica
G	D	Aristida caput-medusae
G	S	Dianella longifolia

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 406-409. Regrowth 11.5.1. not representative of 11.3.25.

Landzone: 5

RE code changes

Existing RE code: 11.5.1 Regrowth

Proposed RE code: 11.5.1 Regrowth

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 21/08/2024

Purpose Vegetation survey- Taylors-RE5

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0281596 N 7015296

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	14	12-16	30%
T2	9	6-12	10%
T3		-	
S1	3	2-6	5%
S2		-	
G		-	

Structural formation: (including height)

Woodland 14m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus populnea
T2	D	Allocasuarina luehmannii
S1	D	Acacia leiocalyx
G	C	Diplachne fusca
G	C	Eragrostis sp.
G	C	Aristida sp.
G	S	Sporobolus sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 411-414. Poplar Box dominant woodland.

Not a part of drainage line vegetation. Remnant of adjacent, predominantly cleared, 11.5.1 **Landzone:** 5

RE code changes

Existing RE code: 11.3.25

Proposed RE code: 11.5.1

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 21/08/2024

Purpose Vegetation survey – Taylors-RE6

Locality: (inc. distance/direction to nearest town) 10 km north of Kogan

GPS: Zone 56 E 0281271 N 7015467

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	18	16-20	25%
T2	13	10-16	15%
T3	7	6-10	5%
S1	4	3-5	5%
S2		-	
G		-	

Structural formation: (including height)

Woodland 18m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus tereticornis
T1	S	Eucalyptus populnea
S1	D	Acacia leiocalyx
G	D	Aristida caput-medusae
G	S	Lomandra sp.
G	S	Diplachne fusca

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 417-420. Remnant 11.3.25 fringing drainage line.

Landzone: 3

RE code changes

Existing RE code: 11.3.25

Proposed RE code: 11.3.25

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 21/08/2024

Purpose Vegetation survey – Taylors-RE7

Locality: (inc. distance/direction to nearest town) 10 km north of Kogan

GPS: Zone 56 E 0281178 N 7015730

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	14-16	25%
T2	11	8-14	20%
T3	6	4-8	5%
S1	3.5	3-4	5%
S2	2	1-3	10%
G		-	

Structural formation: (including height)

Woodland 15m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus populnea
S1	D	Acacia loroloba
S1	S	Acacia leiocalyx
G	D	Aristida caput-medusae
G	S	Cheilanthes sieberi
G	S	Vittadinia sp.
G	S	Glandularia aristigera
G	S	Sphaeromorphaea australis

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 423-426. Remnant Poplar Box dominant in T1, T2, and T3.

Landzone: 3

RE code changes

Existing RE code: 11.3.2

Proposed RE code: 11.3.2

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 21/08/2024

Purpose Vegetation survey – Taylors-RE8

Locality: (inc. distance/direction to nearest town) 10 km north of Kogan

GPS: Zone 56 E 0281381 N 7015644

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G		-	

Structural formation: (including height)

Grassland 0.5m tall

Ecologically dominant layer: G

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	D	Aristida sp.
G	S	Bothriochloa sp. (no fertile material).
G	S	Calotis sp.
G	S	Vittadinia sp.
G	S	Sphaeromorphaea australis
G	S	Cheilanthes sieberi

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 427-431. Cleared for pasture. Not pasture improved. 15% weed cover.

Most of the ground layer is potentially native (greater than 50%). Likely senesced derived grassland. **Landzone:** 5

RE code changes

Existing RE code: Cleared

Proposed RE code: Derived Grassland

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 21/08/2024

Purpose Vegetation survey – Taylors-RE9

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0281251 N 7015638

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	18	16-21	15%
T2	13	10-16	25%
T3	7	6-10	10%
S1	3	3-4	5%
S2	2	1-3	5%
G		-	

Structural formation: (including height)

Woodland 18m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus tereticornis
T1	S	Eucalyptus populnea
T3	D	Callitris glaucophylla
S1	C	Acacia leiocalyx
S1	C	Acacia salicina
S2	D	Pimelea neo-anglica
S2	S	Maireana microphylla
G	D	Aristida caput-medusae

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 432-435. Eucalypt woodland adjacent to drainage feature.

Landzone: 3

RE code changes

Existing RE code: Cleared

Proposed RE code: 11.3.25

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 21/08/2024

Purpose Vegetation survey- Taylors-RE10

Locality: (inc. distance/direction to nearest town) 10 km north of Kogan

GPS: Zone 56 E 0281455 N 7015399

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	12.5	10-15	15%
T2	7.5	5-10	5%
T3		-	
S1	4	3-5	5%
S2	2	1-3	5%
G		-	

Structural formation: (including height)

Woodland at 12.5m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus populnea
G	D	Aristida caput-medusae
G	S	Bothriochloa sp. (no fertile material)
G	S	Calotis sp.
G	S	Cheilanthes sieberi
G	S	Glandularia aristigera

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 436-439. Sparse Poplar Box adjacent to 11.3.25 fringing woodland. Poplar Box is recruiting/regrowing into adjacent derived grassland. Poplar Box dominant in T1, T2, S1. and S2.

Landzone: 5

RE code changes

Existing RE code: Cleared

Proposed RE code: 11.5.1 Regrowth

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 21/08/2024

Purpose Vegetation survey – Taylors-RE11

Locality: (inc. distance/direction to nearest town) 10 km north of Kogan

GPS: Zone 56 E 0281669 N 7015355

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		-	
S2		-	
G	0.3	0.1-0.5	65%

Structural formation: (including height)

Grassland

Ecologically dominant layer: G

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
G	D	Aristida caput-medusae
G	S	Panicum sp.
G	S	Eragrostis sp.
G	S	Enteropogon sp.
G	S	Sphaeromorphaea australis
G	S	Calotis lappulacea
G	S	Sporobolus sp.

Geology, landform, soils

Geology map/scale/year: _____

Geology code and rock types: _____

Land system: _____

Landform: _____

Soils: _____

Field observation and notes: Photos 440-443. Derived grassland. Bare ground ~35% and weed cover ~5%.

Landzone: 5

RE code changes

Existing RE code: Cleared

Proposed RE code: Derived Grassland

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 21/08/2024

Purpose Vegetation survey -Taylors RE12

Locality: (inc. distance/direction to nearest town) 10 km North of Kogan

GPS: Zone 56 E 0281799 N 7014862

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	10-12	30 %
T2		-	
T3		-	
S1	3	2-5	15 %
S2		-	
G		-	

Structural formation: (including height)

Woodland 11m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	C	Allocasuarina luehmannii
T1	C	Callitris glaucophylla
T1	S	Eucalyptus tereticornis
S1	D	Acacia loroloba
G	D	Aristida caput-medusae
G	S	Cheilanthes sieberi
G	S	Eremophila debilis
G	S	Calotis cuneifolia
G	S	Aristida sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 462 – 465. Regrowth 11.5.1. main canopy tree species absent.

Landzone: 5

RE code changes

Existing RE code: 11.5.1 Regrowth

Proposed RE code: 11.5.1 Regrowth

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

KoganCk-40

Location

Site No. RÉA17 Recorder: Josh Prostamo Day/Date: 31/7/24

Purpose TWRP

Locality: (inc. distance/direction to nearest town) Kogan Creek

GPS: GDA2020 Zone 56 E 0277096 N 7015286

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	14 - 18	M
T2	7	6 - 8	M
T3		-	
S1	0.8	0 - 2	S
S2		-	
G	0.3	0.1 - 0.5	S

Structural formation: (including height)

Open woodland to 18m

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum; *d* – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus crebra
T1	S	Eucalyptus Moluccana
T2	D	Callitris sp.
T2	S	Allocasuarina luehmannii
G	D	Aristida caput-medusae
G	A	Cahnia aspera
G	A	Lomandra longifolia

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils: Dark Brown Sandy loam

Field observation and notes: like JP-10 with some E. moluccana.

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 22/08/2024

Purpose Vegetation survey – Taylors-RE13

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0280344 N 7016015

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	16	15-17	20%
T2	12	10-15	15%
T3		-	
S1	3	2-4	10%
S2		-	
G		-	

Structural formation: (including height)

Woodland 16m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus populnea
T2	S	Callitris glaucophylla
S1	S	Acacia leiocalyx
G	D	Aristida caput-medusae
G	S	Dianella longifolia
G	S	Cyperus sp
G	S	Austrostipa sp.
G	S	Dichondra repens

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 497-500. Poplar Box dominant woodland. Small patch adjacent to road.

Landzone: 5

RE code changes

Existing RE code: 11.3.25

Proposed RE code: 11.5.1

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 22/08/2024

Purpose Vegetation survey – Taylors-RE14

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0280353 N 7016111

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	15	15-15	3%
T1	9.5	9-10	15%
T2		-	
T3		-	
S1	2	2-3	5%
S2		-	
G		-	

Structural formation: (including height)

Woodland 9.5m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
D	E	Eucalyptus populnea
D	T1	Callitris glaucophylla
G	D	Aristida caput-medusae
G	S	Dianella longifolia
G	S	Cyperus sp.
G	S	Austrostipa sp.
G	S	Dichondra repens

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 501-504. Regrowth Poplar Box on Land zone 5. Poplar box in T2 and S1.

Landzone: 5

RE code changes

Existing RE code: 11.3.25

Proposed RE code: 11.5.1 Regrowth

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 22/08/2024

Purpose Vegetation survey – Taylors-RE15

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0280492 N 7015977

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	13	12-15	6%
T1	9.5	9-10	25%
T2	5.5	3-9	15%
T3		-	
S1	1.5	1-3	10%
S2		-	
G		-	

Structural formation: (including height)

Woodland 9.5m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
E	C	Eucalyptus populnea
E	C	Eucalyptus tereticornis
T1	D	Callitris glaucophylla
S1	D	Acacia loroloba
G	D	Aristida caput-medusae
G	S	Dianella sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 505-508. Regrowth 11.5.1 adjacent to drainage feature.

Landzone: 5

RE code changes

Existing RE code: Cleared

Proposed RE code: 11.5.1 Regrowth

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 22/08/2024

Purpose Vegetation survey - Taylors-RE16

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0280532 N 7015963

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	22	20-25	25%
T2	12	8-15	25%
T3	5	3-8	5%
S1	2	1-3	5%
S2		-	
G		-	

Structural formation: (including height)

Woodland at 22m

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus tereticornis
T2	D	Callitris glaucophylla
S1	D	Acacia loroloba
G	D	Chloris ventricosa
G	S	Cheilanthes sieberi
G	S	Enteropogon sp.
G	S	Cyperus sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 509-512. Remnant 11.3.25 fringing drainage line.

Landzone: 3

RE code changes

Existing RE code: 11.3.25

Proposed RE code: 11.3.25

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 22/08/2024

Purpose Vegetation survey – Taylors-RE17

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0281604 N 7014492

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	24	20-30	30%
T2	11	6-14	20%
T3	4.5	3-6	10%
S1	1.5	1-3	10%
S2		-	
G		-	

Structural formation: (including height)

Woodland 24m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus tereticornis
S1	D	Acacia loroloba
S1	S	Dodonaea sp.
S1	S	Acacia leiocalyx
G	D	Arundinella nepalensis
G	S	Sida sp.
G	S	Cyperus sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 522-525. Eucalyptus tereticornis dominant fringing woodland.

Hollow bearing trees common along creek line. E. tereticornis dominant in T1 and T2. **Landzone:** 3

RE code changes

Existing RE code: Cleared

Proposed RE code: 11.3.25

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 22/08/2024

Purpose Vegetation survey – Taylors-RE18

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0281726 N 7014046

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15.5	14-17	30%
T2	9	6-14	15%
T3		-	
S1	3	2-6	10%
S2		-	
G		-	

Structural formation: (including height)

Woodland 15.5m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus populnea
S1	D	Eremophila mitchellii
S1	S	Pittosporum angustifolium
S1	S	Parsonsia eucalpytophylla
G	D	Chloris ventricosa
G	S	Glandularia aristigera
G	S	Aristida sp.
G	S	Austrostipa sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 526-529. Degraded section of 11.3.25. Local dominance of Eucalyptus populnea.

Landzone: 5

RE code changes

Existing RE code: Cleared

Proposed RE code: 11.3.25

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 22/08/2024

Purpose Vegetation survey – Taylors-RE19

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0281818 N 7013766

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	21	18-24	35%
T2	14	10-18	15%
T3	7	4-10	10%
S1	3	2-4	5%
S2	1.5	1-2	5%
G		-	

Structural formation: (including height)

Woodland 21m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus tereticornis
S1	S	Jasminum didymium subsp. lineare
S1	D	Acacia loroloba
S1	S	Acacia leiocalyx
G	D	Aristida caput-medusae
G	S	Cyperus sp.
G	S	Arundinella nepalensis
G	S	Lomandra sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 530-533. Fringing woodland vegetation.

Landzone: 3

RE code changes

Existing RE code: Cleared

Proposed RE code: 11.3.25

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 22/08/2024

Purpose Vegetation survey -Taylors-RE20

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0281793 N 7013538

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	12	10-14	15%
T2	7	4-10	15%
T3		-	
S1	2.5	1-4	5%
S2		-	
G		-	

Structural formation: (including height)

Woodland 12m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
		Eucalyptus populnea
		Callitris glaucophylla
		Dodonaea sp.
		Acacia leiocalyx
		Allocasuarina luehmannii
		Acacia sp.
		Aristida caput-medusae
		Chloris ventricosa
		Glandularia aristigera
		Cymbopogon refractus

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 534-537. Regrowth Poplar Box dominant woodland.

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1 Regrowth

END

North

East

South

West

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 22/08/2024

Purpose Vegetation survey – Taylors-RE21

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0281905 N 7013195

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E			
T1	23	20-26	25%
T2	15	10-20	25%
T3	7	4-10	10%
S1	3	2-4	5%
S2		-	
G		-	

Structural formation: (including height)

Woodland 23m in height

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
		Eucalyptus tereticornis
		Acacia harpophylla
		Eucalyptus populnea
		Allocasuarina luehmannii
		Chloris ventricose
		Maireana microphylla
		Aristida caput-medusae
		Diplachne fusca
		Arundinella nepalensis

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 538-541. Eucalyptus tereticornis dominant with Acacia harpophylla in T1 and T2.

Some large mature trees in this section. **Landzone:** 3

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.3.25

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 22/08/2024

Purpose Vegetation survey – Taylors-RE22

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0281778 N 7012970

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	22	19-25	25%
T2	16.5	14-19	20%
T3	11	5-14	10%
S1		2-4	15%
S2		-	
G		G	

Structural formation: (including height)

Woodland 22m tall.

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus tereticornis
T2	S	Eucalyptus populnea
T2	S	Eucalyptus crebra
S1	S	Geijera parviflora
S1	D	Acacia sp.
G	C	Arundinella nepalensis
G	C	Diplachne fusca
G	S	Cyperus sp
G	S	Dianella sp.
G	S	Nyssanthes sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 542-545. Eucalyptus tereticornis fringing woodland.

Eucalyptus tereticornis dominant in both T1, T2, and T3. **Landzone:** 3

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.3.25

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 23/08/2024

Purpose Vegetation survey – Taylors-RE23

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0282384 N 7013959

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1	3	2-4	5%
S2		-	
G		-	

Structural formation: (including height)

Grassland

Ecologically dominant layer: G

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
S1	D	Allocasuarina luehmannii
G	D	Aristida caput-medusae
G	S	Aristida sp.
G	S	Cheilanthes sieberi
G	S	Fimbristylis dichotoma
G	S	Glandularia aristigera
G	S	Bothriochloa sp. (no fertile material)

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 593-596. Derived grassland and not pasture improved. Very difficult to identify any grass species due to seasonal conditions. Greater than 50% native ground vegetation cover.

Landzone: 5

RE code changes

Existing RE code: Non-remnant - Cleared

Proposed RE code: Non-remnant - Derived Grassland

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 23/08/2024

Purpose Vegetation survey – Taylors-RE24

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0282525 N 7013882

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	10	8-12	25%
T2	6	4-8	15%
T3		-	
S1	2.5	1-4	10%
S2		-	
G		-	

Structural formation: (including height)

Woodland 10m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Allocasuarina luehmannii
T1	S	Callitris glauophylla
S1	D	Acacia loroloba
G	D	Aristida caput-medusae
G	S	Chrysocephalum apiculatum
G	S	Cheilanthes sieberi

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 597-600. Ground layer not diverse. Regrowth vegetation thinned with no Eucalypts.

Landzone: 5

RE code changes

Existing RE code: 11.5.1 Regrowth

Proposed RE code: 11.5.1 Regrowth

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 23/08/2024

Purpose Vegetation survey -Taylors-RE25

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0282653 N 7013650

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1	3	2-4	5%
S2		-	
G		-	

Structural formation: (including height)

Grassland

Ecologically dominant layer: G

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
S1	D	Allocasuarina luehmannii
S1	S	Acacia loroloba
G	D	Aristida caput-medusae
G	S	Cheilanthes sieberi
G	S	Fimbristylis dichotoma
G	S	Glandularia aristigera
G	S	Bothriochloa sp. (no fertile material)
G	S	Aristida sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 601-604. Derived grassland and not pasture improved. Very difficult to identify any grass species due to seasonal conditions. Greater than 50% native ground vegetation cover.

Landzone: 5

RE code changes

Existing RE code: Cleared

Proposed RE code: Derived Grassland

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 02/09/2024

Purpose Vegetation survey – Taylors-RE26

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0282747 N 7014258

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1		2-6	
S2		-	
G		-	

Structural formation: (including height)

Grassland

Ecologically dominant layer: G

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
S1	D	Callitris glaucophylla
S1	S	Allocasuarina luehmannii
G	D	Aristida caput-medusae
G	S	Eragrostis sp.
G	S	Wahlenbergia sp.
G	S	Cheilanthes sieberi
G	S	Calotis lappulacea
G	S	Aristida calycina
G	S	Panicum sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 0002-0005. Ground layer dominant with more than 50% native grass/forb cover.

Landzone: 7

RE code changes

Existing RE code: Cleared

Proposed RE code: Derived Grassland

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 02/09/2024

Purpose Vegetation survey – Taylors-RE27

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 5 6 E 0 2 8 2 8 5 4 N 7 0 1 4 0 8 9

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	14	14-14	3%
T1	9.5	7-12	30%
T2	5.5	4-7	20%
T3		-	
S1		-	
S2		-	
G		-	

Structural formation: (including height)

Woodland 9.5m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
E	D	Angophora leiocarpa
T1	D	Callitris glaucophylla
T1	S	Allocasuarina luehmannii
T1	S	Eucalyptus crebra
T1	S	Lysiana exocarpi
S1	S	Acacia leiocalyx
S1	S	Acacia conferta
G	D	Aristida caput-medusae
G	S	Dianella sp.
G	S	Laxmannia gracilis

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 0006-0009. Regrowth A. luehmannii dominant woodland.

Allocasuarina luehmannii and Callitris glaucophylla dominant across most layers **Landzone:** 7

RE code changes

Existing RE code: 11.5.1 Regrowth

Proposed RE code: 11.5.1 Regrowth

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 03/09/2024

Purpose Vegetation survey – Doobette-RE1

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 5 6 E 0 2 8 3 5 2 3 N 7 0 1 4 5 7 0

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	13.5	12-15	15%
T2	9	6-12	15%
T3		-	
S1	3	2-4	20%
S2		-	
G		-	

Structural formation: (including height)

Woodland 13.5m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	*Eucalyptus creabra*
T1	S	*Acacia burrowii*
T1	S	*Callitris glaucophylla*
S1	S	*Acacia melvillei*
S1	S	*Acacia conferta*
S1	S	*Alphitonia excelsa*
G	C	*Digitaria* sp.
G	C	*Dianella longifolia*
G	C	*Solanum parvifolia*
G	C	*Aristida* sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 0010-0013. Disturbed Eucalyptus crebra woodland.

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 03/09/2024

Purpose Vegetation survey – Doobette-RE2

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 5 6 E 0 2 8 2 8 2 3 N 7 0 1 4 2 3 8

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	16.5	15-18	15%
T2	10	7-14	30%
T3		-	
S1		2-4	10%
S2		-	
G		-	

Structural formation: (including height)

Woodland 16.5 m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
		Eucalyptus crebra
		Allocasuarina luehmannii
		Callitris glaucophylla
		Acacia leiocalyx
		Acacia conferta
		Aristida caput-medusae
		Brachyscome multifida
		Lepidosperma laterale
		Solanum parvifolium
		Entolasia stricta

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 0023-0026.

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 03/09/2024

Purpose Vegetation survey – Doobette-RE3

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0282935 N 7014053

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	18	15-22	25%
T2	12	10-14	20%
T3	8	5-10	15%
S1	2.5	2-4	5%
S2		-	
G		-	

Structural formation: (including height)

Woodland 18m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	*Eucalyptus crebra*
T1	S	*Angophora leiocarpa*
T2	D	*Allocasuarina luehmannii*
T2	S	*Callitris glaucophylla*
S1	C	*Acacia leiocalyx*
S1	C	*Acacia conferta*
G	D	*Aristida caput-medusae*
G	S	*Brachyscome multifida*
G	S	*Lepidosperma laterale*
G	S	*Lomandra* sp.

Geology, landform, soils

Geology map/scale/year: _____

Geology code and rock types: _____

Land system: _____

Landform: _____

Soils: _____

Field observation and notes: Photos 0027-0030. *Eucalyptus crebra* dominant woodland.

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 03/09/2024

Purpose Vegetation survey – Doobette-RE4

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0283130 N 7013984

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	18	15-22	25%
T2	12	10-14	20%
T3	8	5-10	15%
S1	2.5	2-4	5%
S2		-	
G		-	

Structural formation: (including height)

Woodland 18m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	*Eucalyptus crebra*
T1	S	*Angophora leiocarpa*
T2	D	*Allocasuarina luehmannii*
T2	S	*Callitris glaucophylla*
S1	C	*Acacia leiocalyx*
S1	C	*Acacia conferta*
G	D	*Aristida caput-medusae*
G	S	*Brachyscome multifida*
G	S	*Lepidosperma laterale*
G	S	*Lomandra* sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 0031-0034. *Eucalyptus crebra* dominant woodland.

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 03/09/2024

Purpose Vegetation survey – Doobette-RE5

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0283826 N 7013224

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	13-17	15%
T2	10	8-12	25%
T3	6	4-8	20%
S1	3	2-4	10%
S2		-	
G		-	

Structural formation: (including height)

Woodland 15m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1		*Eucalyptus crebra*
T2	D	*Callitris glaucophylla*
T3	D	*Acacia leiocalyx*
S1	S	*Acacia* sp.
G	D	*Aristida caput-medusae*
G	S	*Lepidosperma laterale*
G	S	*Brachyscome multifida*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 0044-0047. Edge effects from adjacent fenceline and cleared land.

Landzone: 7

RE code changes

Existing RE code: 11.7.4

Proposed RE code: 11.7.4

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 03/09/2024

Purpose Vegetation survey – Doobette-RE6

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 5 6 E 0 2 8 3 8 5 3 N 7 0 1 3 2 6 8

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1	2	1-3	15%
S2		-	
G		-	

Structural formation: (including height)

Shrubland 2m tall

Ecologically dominant layer: S1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
S1	C	*Acacia conferta*
S1	C	*Acacia melvillei*
S1	C	*Acacia leiocalyx*
S1	S	*Cassinia laevis*
G	C	*Aristida caput-medusae*
G	C	*Cenchrus ciliaris*
G	S	*Solanum nemophilum*
G	S	*Calotis* sp.
G	S	*Brachyscome multifida*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 0048-0051. Shrubby *Acacia* regrowth from previous pulling of vegetation.

Landzone: 7

RE code changes

Existing RE code: Cleared

Proposed RE code: Undifferentiated Regrowth

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 03/09/2024

Purpose Vegetation survey – Doobette-RE7

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 5 6 E 0 2 8 4 0 7 9 N 7 0 1 2 9 3 4

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	8	5-11	30%
T2		-	
T3		-	
S1	2	1-3	15%
S2		-	
G		-	

Structural formation: (including height)

Woodland 8m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	*Eucalyptus crebra*
T1	S	*Acacia* sp.
G	D	*Aristida caput-medusae*
G	S	*Lepidosperma laterale*
G	S	*Brachyscome multifida*
G	S	*Cyanthillium cinereum*
G	S	*Chloris ventricosa*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 0052-0055. Regrowth *Eucalyptus crebra* woodland.

Landzone: 7

RE code changes

Existing RE code: Cleared

Proposed RE code: 11.7.4 Regrowth

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 03/09/2024

Purpose Vegetation survey – Doobette-RE8

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 56 E 0284091 N 7013024

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1		-	
T2		-	
T3		-	
S1	1.5	1-2	15%
S2		-	
G		-	

Structural formation: (including height)

Shrubby pasture 1.5m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
S1	C	*Acacia leiocalyx*
S1	C	*Acacia conferta*
S1	S	*Eucalyptus crebra*
S1	S	*Alphitonia excelsa*
G	D	*Aristida caput-medusae*
G	S	*Cenchrus ciliaris*
G	S	*Cheilanthes sieberi*
G	S	*Wahlenbergia* sp.
G	S	*Oxalis* sp.
G	S	*Senecio* sp. (native)

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 0056-0059. Shrubby undifferentiated regrowth in recently pulled pasture.

Landzone: 7

RE code changes

Existing RE code: Cleared

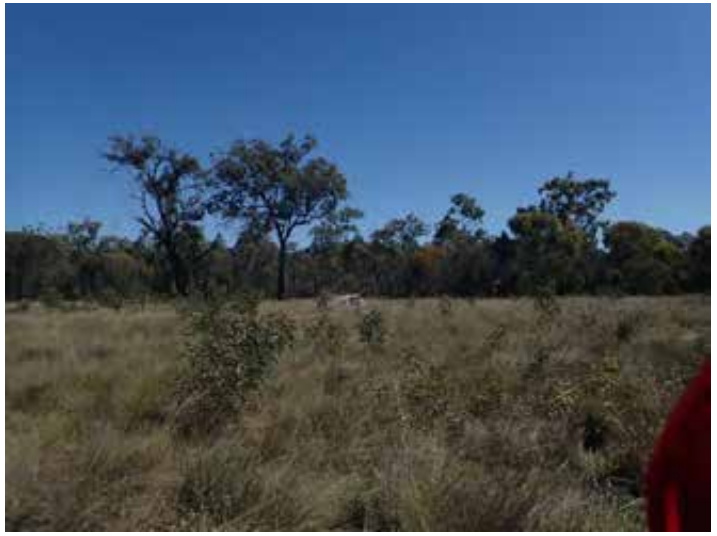
Proposed RE code: Undifferentiated Regrowth

END

North

East

South



West

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. _____ **Recorder:** Daniel Kelly **Day/Date:** 03/09/2024

Purpose Vegetation survey – Doobette-RE9

Locality: (inc. distance/direction to nearest town) 10km north of Kogan

GPS: Zone 5 6 E 0 2 8 3 7 0 6 N 7 0 1 7 4 7 8

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	14	12-16	25%
T2	10	8-12	10%
T3		-	
S1	2	1-3	10%
S2		-	
G		-	

Structural formation: (including height)

Woodland 14m tall

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s -** subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	*Acacia harpophylla*
T1	S	*Casuarina cristata*
S1	C	*Geijera parviflora*
S1	C	*Carissa ovata*
S1	C	*Alectyon diversifolius*
G	C	*Sclerolaena birchii*
G	C	*Chloris ventricosa*
G	C	*Enteropogon* sp.
G	C	*Maireana microphylla*
G	C	*Tetragonia tetragonoides*

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils:

Field observation and notes: Photos 0060-0063. Brigalow dominant woodland on land zone 4.

Landzone: 4

RE code changes

Existing RE code: 11.7.4/11.7.7/11.7.5

Proposed RE code: 11.4.3 Regrowth

END

North

East

South

West

A 1.1 Sheet D – Regional Ecosystem type assessment site

KoganCk_RE21

Location

Site No. **Recorder:** Thiago Moura **Day/Date:** 24 July 2024

Purpose Extension of Biodiversity values record on Kogan-T9

Locality: (inc. distance/direction to nearest town) Approx 8 km South of Kogan, QLD.

GPS: GDA2020 Zone 56 E 0275342 N 7015444

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	2	2 - 3	M
T2		-	
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height)
Shrunbland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Acacia leiocalyx
T1	C	Acacia crassa
S1	A	Acacia crassa
S1	A	Callitris glaucophylla

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: MISCELLANEOUS UNCONSOLIDATED SEDIMENTS

Land system:

Landform: Plains - Flat

Soils: Sandy and, red sandy soil, silt and some gravel

Field observation and notes: No habitat feature for grey snake. Existinting power line

Landzone: 5

RE code changes

Existing RE code: 11.5.1 Regrowth

Proposed RE code: Regrowth Undifferentiated

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

KoganCk_RE23

Location

Site No. **Recorder:** Thiago Moura **Day/Date:** 24 July 2024

Purpose Extension of Biodiversity values record on Kogan-T9

Locality: (inc. distance/direction to nearest town) Approx 8 km South of Kogan, QLD.

GPS: GDA2020 Zone 56 E 0275590 N 7015429

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	2	2 - 3	M
T2		-	
T3		-	
S1	1	1 - 2	S
S2		-	
G	0.1	0.1 - 0.5	S

Structural formation: (including height)
Shrunbland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Acacia leiocalyx
T1	C	Acacia crassa
S1	A	Acacia crassa
S1	A	Callitris glaucophylla

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: MISCELLANEOUS UNCONSOLIDATED SEDIMENTS

Land system:

Landform: Plains - Flat

Soils: Sandy and, red sandy soil, silt and some gravel

Field observation and notes: No habitat feature for grey snake. Existinting power line

Landzone: 5

RE code changes

Existing RE code: 11.5.1 Regrowth

Proposed RE code: Regrowth Undifferentiated

END

North face of ESU

East face of ESU

South face of ESU

West face of ESU

A 1.1 Sheet D – Regional Ecosystem type assessment site

KoganCk-RE38

Location

Site No. REA15 Recorder: Josh Prostano Day/Date: 31/7/24

Purpose TWRP

Locality: (inc. distance/direction to nearest town) Kogan creek

GPS: GDA2020 Zone 56 E 0277209 N 7015110

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	17	12 - 16	M
T2	8.5	8 - 10	M
T3		-	
S1	1.5	0 - 2	S
S2		-	
G	0.3	0.1 0.5	

Structural formation: (including height)

open woodland to 16m

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
T1	S	Eucalyptus moluccana
T1	D	Eucalyptus crebra
T2	D	Callitris sp
S	D	acacia leiocalyx
S	S	acacia Deanii
G	S	galaxia asperula

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils: Dark grey/Brown sandy soil, uniform

Field observation and notes: like JP-10 with the inclusion of E. moluccana as a co-dominant.

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

KoganCk-RE39

Location

Site No. RGA16 Recorder: Joshua Prostamo Day/Date: 31/7/24

Purpose TWZP

Locality: (inc. distance/direction to nearest town) Kogan Creek

GPS: GDA2020 Zone 56 E 0277030 N 7015568

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	9	10 - 12	M
T2	5	4 - 7	M
T3		-	
S1	1.5	0 - 2	M
S2		-	
G	0.3	0.1 - 0.5	M

Structural formation: (including height)

Open woodland to 10m

Ecologically dominant layer:

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus moluccana
T2	D	" "
S	D	Acacia Deanii
G	D	Aristida caput medusae
G	A	Sporobolus sp.
G	A	Sida Hackettiana

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils: Pale uniform sandy soil

Field observation and notes: similar to JP-11 w/ more T2 regrowth. may not meet rem status

Landzone: 5

RE code changes

Existing RE code: 11.5.1 regrowth

Proposed RE code: 11.5.20 regrowth

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

KoganCK-RE41

Location

Site No. RE418 Recorder: Josh Prostamo Day/Date: 31/7/24

Purpose TWRP

Locality: (inc. distance/direction to nearest town) Kogan Creek

GPS: GDA2020 Zone 56 E 0277046 N 7015354

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	12	12 - 14	M
T2	7	6 - 8	M
T3		-	
S1	1.2	0 - 2	M
S2		-	
G	0.3	0.1 - 0.5	

Structural formation: (including height)

open woodland to 15m.

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
T1	D	Eucalyptus populnea
T1	S	Eucalyptus crebra
T1	S	Eucalyptus miniacana
T2	D	Allocasuarina leuhmannii
T2	S	Callitris sp.
G	D	Aristida caput-medusae.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils: Dark sandy soil with some pebbles, mostly quiliora

Field observation and notes: Likely still LZ5. similar to JP10

Landzone: 5

RE code changes

Existing RE code:

Proposed RE code: 11.5.1

END

A 1.1 Sheet D – Regional Ecosystem type assessment site

KoganCK-RE42

Location

Site No. REA19 Recorder: Josh Prostama Day/Date: 31/7/24

Purpose TWRP

Locality: (inc. distance/direction to nearest town) Kogan creek

GPS: GDA2020 Zone 56 E 0217124 N 7014595

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	12	10 - 14	M
T2	6	4 - 7	M
T3		-	
S1	1.2	0 - 2	S
S2		-	
G	0.3	0.1 - 0.5	S

Structural formation: (including height)

open woodland to 14m

Ecologically dominant layer: t1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
t1	D	Eucalyptus populnea
t1	S	Eucalyptus tereticornis
t1	A	Eucalyptus crebra
t2	A	Allocasuarina leuhmannii
t2	A	Callitris sp.
G	D	Aristida sp
G	S	Alloteropsis semialata
G	A	Eragrostis sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils: Pale grey w/ polygonal pebbles

Field observation and notes: Likely alluvium, similar to JP-12 with tereticornis being more abundant.

Landzone: 3

RE code changes

Existing RE code: 11.3.4

Proposed RE code: 11.3.4

END

RE2

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location Wyalla - RE 9

Site No. **Recorder:** Nazim Uddin **Day/Date:** 26.06.2024

Purpose Ecological site Assessment

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0280938 N 7014638

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	16	14 - 18	M
T2	9	8 - 10	S
T3	3	2 - 4	S
S1	1.5	1 - 2	S
S2		-	
G	0.4	0.1 - 0.7	S

Structural formation: (including height) Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
T1	d	E. woollsiana
T2	c	"
T3	a	Casuarina leuhmannii
S1	a	Acacia Confertae.
G	a	Aristida caput-medusae
G	a	Bonnellia caerulea
G	a	Panicum spp.
G	a	Chelanthes sieberi

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system: Woodland.

Landform: Flat to gently undulating plains

Soils: Sandy loam

Field observation and notes: E. Woollsiana dominated woodland no soil cracks, Photos: 6668-71 **Landzone:** 05

RE code changes

Existing RE code: 11.5.20

Proposed RE code: 11.5.20

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

A 1.1 Sheet D – Regional Ecosystem type assessment site

KoganCk-RE37

Location

Site No. REA14 Recorder: Josh Prestano Day/Date: 31/7/24

Purpose twrp.

Locality: (inc. distance/direction to nearest town) Kogan creek

GPS: GDA2020 Zone 56 E 0277187 N 7014558

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	14	13 - 16	M
T2	7.5	7 - 9	M
T3		-	
S1	1	0 - 2	M
S2		-	
G	0.3	0.1 - 0.5	S

Structural formation: (including height)

Open woodland to 15m

Ecologically dominant layer: t1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; c – co-dominant; s - subdominant, a – associated.

Str.	Rel. dom.	Scientific Name
t1	D	Eucalyptus crebra
t1	A	Angophora leiocarpa
t2	D	Acacia excelsa
t2	A	callitris glaucophylla
G	D	Gahnia aspera
G	A	Aristida caput-medusae
G	A	Digitaria sp.
S	C	Acacia Deani
S	C	Acacia leiocalyx

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types:

Land system:

Landform:

Soils: Brown Sandy soil at Bottom of slope.

Field observation and notes: like JP-08. pop. Box absent/scattered. check L2 mapping. unlikely alluvium

Landzone: 5

RE code changes

Existing RE code: 11.3.4

Proposed RE code: 11.5.1

END

SITE IDENTIFICATION			
Site Name:	11-5-20-1	**Date:**	23/03/2022
Tenure:	PL493	**Assessor(s):**	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	670 281193
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014807
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 247		#	
East	# ↓		#	
South	#		#	
West	# 245		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	Absent	Scattered	Frequent
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%		>76%		n/a	
Site condition	Very good	Good	Moderate		Poor		Degraded	
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	10					**Avg DBH (cm) of EDL**			25			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	~~Found on Site – records below~~	Not Found On Site
Weed infestations	~~Found on Site – records below~~	~~Not Found On Site~~

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Eragrostis curvula	Scattered	throughout	ESU		

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SE	Start Easting	671	281183		End Easting	669	281208			
		Start Northing		7014829		End Northing		7014785			
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		7	12	3	5					0.5	1.5
Canopy cover (%)		30		5						2	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Bothriochloa decipiens								
Cymbopogon refractus								
Eragrostis leptostachya								
Chloris ventricosa								
Paspalidium distans								
Eriochloa crebra								
Sporobolus/Vinery w/ gaps	Sporobolus creber							
* Eragrostis curvula								
Aristida vagosa								
Panicum effusum								
~~Non-target Plants~~								
~~Fuggy~~ Digitaria divaricatissima								
Bothriochloa ewartiana								
Aristida capit-medusae								
Portulaca oleracea								
Sida corrugata								
Callitris glaucophylla		4			1111 (4)			
Alloceasuarina littoralis		1		(1)				
Eucalyptus woollsiana		29		1111 (24)	1111 111 (8)			
Dodonaea viscosa		2						11 (2)
Eucalyptus crebra		30		1111 1111 (20)	1111 111 (9)			1 (1)

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Einadia nutans								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #						
Native perennial grass	95	90	45	40	30	58
Native other grass (if relevant)						
Native forbs and other species (non-grass)		10	5		20	7
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs				5		1
Litter	10 15		50	55	45	33
Rock						
Bare ground					5	1
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE 3D ecosmart	11.5.20	NA	LC	NCaP
Survey result	11	11	11	11
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	1	No. of hollow logs	1	Total length of logs (>10cm)	6 8 142	No. of logs (>10cm)	171 (3)
Per hectare (x 20)	20	Per hectare (x 20)	20	Per hectare (x 20)	180	Per hectare (x 20)	60

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Trees >4m
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	(Yes) / No (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	Cleared-1	Date:	23/03/2022
Tenure:	PL493	Assessor(s):	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	1667 281662
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7013976
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 233		#	
East	# ↓		#	
South	# ↓		#	
West	# 236		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	(Pale)	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	Absent		(Scattered)		Frequent				
Erosion Type	Tunnelling	(Sheet)	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G
Avg height (m) of EDL				10		**Avg DBH (cm) of EDL**			30		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Eragrostis curvula	Scattered	throughout	roadside		
Opuntia tomentosa	Scattered	"	Y		

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	1668 281656	End Easting	1666 281664		
		Start Northing	7014000	End Northing	7013951		
Stratum	E	T1	T2	T3	S1	S2/Seedlings	
Height range (m)		8 | 12	3 | 5		1.5 | 2	0 | 0.5	
Canopy cover (%)		25	10		5	1	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
* Glandularia aristigera								
Bothriochloa decipiens								
Eragrostis leptostachya								
Cymbopogon refractus								
Panicum effusum								
Digitaria ~~[illegible]~~ divaricatissima								
Fimbristylis dichotoma								
Aristida ramosa								
Enchylaena tomentosa								
* Eragrostis cumula								
Enneapogon gracilis								
* Opuntia tomentosa		1						(1)
Acacia leiocalyx		1					(1)	
Dichondra argyrotrichum		5					(1)	IIII (4)
Eucalyptus orebra		27		~~HH TTH~~ (10)	~~HH HH HH~~ (15)		11 (2)	

Ecological Field Survey DRG-ARW-HSM-FOR-00067

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	237	→	→	→	241	
Native perennial grass	~~90~~ 78	80	69	30	40	59.4
Native other grass (if relevant)						
Native forbs and other species (non-grass)			1	15	10	5.2
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs	2					0.4
Litter	20	20	30	40	25	27
Rock						
Bare ground				15	25	8
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE 3Decosmart	Cleared	NA	NA	NA
Survey result	"	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	3.5	No. of logs (>10cm)	2
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	70	Per hectare (x 20)	40

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)	Other Information (e.g. age, collected, active/inactive)
			Easting / Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Trees >4m
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	WKI KN Rd intersection	Date:	23/03/2022
Tenure:	PL 493	Assessor(s):	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	Easting (E) 1658	281550
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7012471
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 205		#	
East	# ↓		#	
South	# ↓		#	
West	# 208		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: Road reserve						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	16		**Avg DBH (cm) of EDL**	35	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	Scattered	throughout ESU			
Eragrostis curvula	High	Along road corridor			

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Flora Survey

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	281553	End Easting	281552
		Start Northing	7012 494	End Northing	7012 446

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		8 | 12	2 | 3			0 | 1
Canopy cover (%)		30	5			1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Chloris ventricosa								
Rhodes reptans	Acrachne nepalensis							
Paspalidium clistaxys								
Bothriochloa decipiens								
* Glossularia aristigera								
* Malvastrum americanum								
* Eragrostis curvula								
Bothriochloa bladhii								
* Panicum coloratum								
* Dodonaea viscosa		5			11 (2)			11 (3)
Lomandra filiformis								
Psydrella (wire have)	Diarrhena caerulea							
Eragrostis aspera								
Digitaria brownii								
Cymbopogon refractus								
* Bidens pilosa								
Agarra breakyx		4		11	1111 (4)			
Allocasuarina huegeliana		7		1111 18 (6)	1			
* Opuntia tomentosa		1						1
Acacia decurrens		5			1111 (4)			1
Eucalyptus populnea		16		1111 1111 (15)				1

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eragrostis sporio								
~~Senna [illegible]~~ sophera								
~~Sida [illegible]~~ Enteropogon ramosus								
Exodopitia dactilis								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	209	→	→	→	213	
Native perennial grass	100	15	65	60	5	49
Native other grass (if relevant)						
Native forbs and other species (non-grass)			5			1
Native shrubs (<1m)						
Non-native grass		85		30	95	42
Non-native forbs and shrubs						
Litter			30	10		8
Rock						
Bare ground						
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE 3Decosmart	11.5.1	NA	LC	NCaP
Survey result	*11.5.1a	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect								
No. Of trees with hollows (>10cm)	11 (2)	No. of hollow logs	* THL (5)	Total length of logs (>10cm)	2+2+8+4 (18)	No. of logs (>10cm)	IIIII (7)
Per hectare (x 20)	40	Per hectare (x 20)	100	Per hectare (x 20)	360	Per hectare (x 20)	140

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Hollows Shedding bark Hollow logs	Marsupials				

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Trees 7m
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	Wara - Kogan Rd	Date:	23/03/2022
Tenure:	PL493	Assessor(s):	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E) 1675	284 211
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7012 590
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 251		#	
East	# ↓		#	
South	# ↓		#	
West	# 254		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)		
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: Road reserve		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL		10	**Avg DBH (cm) of EDL**	40	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	~~Found on Site – records below~~	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	scattered	throughout	roadside		

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	WSW	Start Easting	1676 284234	End Easting	1674 284190
		Start Northing	7012397	End Northing	7012878

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		10 | 12	~~5~~ | 6		1 | 2·5	0 | 0·5
Canopy cover (%)		15	40		5	1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
* ~~Panicum~~	Megathyrsus maximus							
	Tinadia natalis							
*	Melastoma americanum							
	Cyperus aspera							
	Mitchell grass	Thyridolepis mitchelliana						
	Paspalidium distans							
	Digitaria diffusa							
	Dianella ~~tasmanica~~ caerulea							
	~~Blue iris~~ Commelina diffusa							
	~~Portea nitida~~							
	Kristida caput-medusae							
	Themeda triandra							
	Corymbia clarksoniana	1		①				
	Acacia torulosa	4					①	11 ③
	Eucalyptus crebra	10		𝍸 ⑦	111 ③			
	Pea (pistol) Indigofera australis	2					11 ②	
	Acacia leptocalyx	9					111 ③	𝍸 1 ⑥
*	Ozothamnus tomentosa	3					①	11 ②
	Calytrix glaucophylla	21		①	𝍸 𝍸 1 ⑯		𝍸 ⑤	
	Angophora leiocarpa	4			11 ②		11 ②	~~1~~
	Allocasuarina luehmannii	51		𝍸 𝍸 ⑩	𝍸 𝍸 𝍸 𝍸 𝍸 111 ㉘		𝍸 𝍸 111 ⑬	

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Cheilanthes sieberi								
* Melinis repens								
* Urochloa aristigera								
~~Rock fern~~								
Evagrostis leptostachya								
~~Purple daisy~~								
Solanum ferocissimum								
~~Daisy~~ ~~daisybush~~	Brachyscome multifida							
Alphitonia excelsa		1						(1)

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	255	→	→	→	259	
Native perennial grass		40	30	85		31
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5		4	5		2·8
Native shrubs (<1m)						
Non-native grass	5					1
Non-native forbs and shrubs			1			0·2
Litter	90	60	55	10	100	63
Rock						
Bare ground			10			2
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE 3D Ecosmart	11·7·7	NA	LC	NCaP
Survey result	11·7·4	NA	LC	"
Agree with mapped RE? If no, provide justification from field data	No, Dominated by E. crebra, not fitzroya.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	2 (10)	No. of logs (>10cm)	IIII (8)
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	200	Per hectare (x 20)	160

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)	Other Information (e.g. age, collected, active/inactive)
			Easting / Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Trees >4m
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes (No)		Is the vegetation suitable for slashing only?
	(Yes) No		Is the slope < 5%?
	(Yes) No		Is the clay content > 20%?
	(Yes) No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

SITE IDENTIFICATION			
Site Name:	Wyalla laydown	Date:	03/08/2022
Tenure:	PL493	Assessor(s):	VICTORIA CREPIN

DEVELOPMENT TYPE & LOCATION			
laydown Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility	Easting (E)	0281614
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7013834
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 20220303_092524		#	
East	# "	_092528	#	
South	# "	_092531	#	
West	# "	_092534	#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect N/A	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type N/A	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

Ecological Field Survey

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	(Clearing)	Cultivation	(Regrowth)	Logging	Thinning	No disturbance						
Dieback	0%	(1-25%)	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	(Poor)	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Cleared											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		(G)	
Avg height (m) of EDL						**Avg DBH (cm) of EDL**						
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		(n/a)	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			(Very sparse)		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed Infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	Scattered	throughout ESU			

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)								
Transect Start compass bearing	5	Start Easting	0281611			End Easting	0281616	
		Start Northing	7013856			End Northing	7013807	
Stratum	E	T1		T2	T3	S1	S2/Seedlings	
Height range (m)		5	7					
Canopy cover (%)		2						

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina luehmanni		2		11				
Eragrostis sp.								
Paspalidium distans								
Eragrostis lacunaria								
Cheilanthes sieberi								
* Glandularia aristigera								
Aristida capt.-medusae								
Sclerolaena birchii								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

Ecological Field Survey

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	092422	092422	092453	092701	092737	
Native perennial grass	95	100	93	99	100	97.4
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5		7	1		2.6
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter						
Rock						
Bare ground						
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Non-rem			
Survey result	Non-rem			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)		No. of hollow logs		Total length of logs (>10cm)		No. of logs (>10cm)	
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

Ecological Field Survey

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Trees < 4m
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Scanned

Ecological Field Survey ORG-ARW-HSM-FOR-[illegible]

targetzero
► zero incidents ► zero injuries

LAR 1214

73

SITE IDENTIFICATION			
Site Name:	Bugalle 35	Date:	1 August 2019
Tenure:	PL 493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	283353
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7078234
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# S1		#	
East	# S2		#	
South	# S3		#	
West	# S4		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	(Black)	Yellow	Grey	Orange	Pale	Brown	Dark	Red	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)		
Erosion		(Absent)			Scattered			Frequent
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	(Clearing)	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	(0%)	1-25%	26-75%	>76%	n/a		
Site condition	Very good	Good	Moderate	Poor	(Degraded)		
Fire scars	(Absent)	Scattered	Frequent	Time since	Recent	Old	Average Height (m)
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	CEST	Rf	H	FOR	WDL	(GRL)	IMP	LKE	RIP	SHR	SW	DIS
Key: CEST-Coastal & estuarine; Rf-Rainforest (including SEVT); H-Heath; FOR-Forest; WDL-Woodland; GRL-Grassland; IMP-Improved pasture; LKE-Lake/dam; RIP-Riparian; SHR-Shrubland; SW-Swamp/Wetland; DIS-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1			T2		S1			S2		(G)
Avg height (m) of EDL						Avg DBH (cm) of EDL					
Canopy cover (%) of EDL	>70% (dense/closed)			(30-70% (mid-dense))		10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		(Absent)

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia aurantica					
O. tomentosa					

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	W 270°	Start Easting	283357	End Easting	283509
		Start Northing	7018235	End Northing	7018241

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)						0-1 / 0-6
Canopy cover (%)						61

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Copper burr	Sclerolaena	anisacanthoides						
Mauve mint bush	Maireana	microphylla						
Wild rape	Brassica	tournefortii						
Mayan pest	Glandularia	aristigera						
Cotton bush	Salsola	australe						
Atriplex nummularia	Atriplex	nummularia						
Tiger pear	Opuntia	aurantiaca						
Chloris divaricata	Chloris	divaricata						
Shepherds purse	Capsella	bursa-pastoris						
Sporobolus caroli	Sporobolus	caroli						

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	85	86	87	88	89	
Native perennial grass						
Native other grass (if relevant)						
Native forbs and other species (non-grass)			70		15	
Native shrubs (<1m)						
Non-native grass	10					
Non-native forbs and shrubs	15	20	10	20	15	
Litter	40	30	5	6	5	
Rock						
Bare ground	35	50	15	74	65	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	cleared		Exempt	
Survey result	Cleared			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)	Other Information (e.g. age, collected, active/inactive)
			Easting / Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	Yes	(No)	
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	(Yes)	No	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological field survey

targetzero
► zero incidents ► zero injuries

LAR 1214

SITE IDENTIFICATION			
Site Name:	Wyella 40	**Date:**	13 August 2019
Tenure:	PL493	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	280 675
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7015084
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 200		#	
East	# 201		#	
South	# 202		#	
West	# 203		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	(Nil)
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil (*field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content*)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	(Silty loam)		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered		Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	15				**Avg DBH (cm) of EDL**							
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa					

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing		Start Easting	280700	End Easting	280653
		Start Northing	7015000	End Northing	7015009

Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)			12	20	2	5			1	2	0.2	1
Canopy cover (%)			25%		2%							

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus woollsiana		14		13				1
Acacia spectabilis		1					1	
Alstonia constricta		2					1	1
Geijera parviflora		2						2
Aristida caput-medusae								
A. calycina								
Entolasia stricta								
Fimbristylis dichotoma								

GTB

T.
76

A. Sue

6m

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	204	205	206	207	208	
Native perennial grass	20	10	10	5	5	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	50	50	50	95	90	
Rock						
Bare ground	30	40	40		5	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4/11.7.7/11.5	NA	LC	NOC
Survey result	11.5.20	NA	LC	NOC
Agree with mapped RE? If no, provide justification from field data	No mapped 11.5.20 by 3D Ecosmart			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	2	Total length of logs (>10cm)	7	No. of logs (>10cm)	5
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

targetzero
► zero incidents ► zero injuries

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	**Likely Species/Group**	**Conservation Status (see below)**	**Coordinates (GDA94)**		**Other Information (e.g. age, collected, active/inactive)**
			Easting	**Northing**	
Tracks					
Formed nests					
Logs					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Tall timber
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

targetzero

CAR 1214

SITE IDENTIFICATION			
Site Name:	WSR16 24	**Date:**	13 August 2019
Tenure:	PL 493	**Assessor(s):**	Peter Nell

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	281652
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014880
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 159		#	
East	# 160		#	
South	# 161		#	
West	# 162		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	(Pale)	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:				
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance				
Dieback	0%	(1-25%)	26-75%	>76%	n/a					
Site condition	Very good	(Good)	Moderate	Poor	Degraded					
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**			
Disturbance notes										

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	(**GRL**)	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	~~T1~~			T2		S1			S2		(G)	
Avg height (m) of EDL						**Avg DBH (cm) of EDL**						
Canopy cover (%) of EDL	>70% (dense/closed)			(30-70% (mid-dense))		10-30% (sparse)			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			(Very sparse)			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing		Start Easting	281678	End Easting	281626
		Start Northing	7014881	End Northing	7014879

Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)	8	8							1	2	0.1	1
Canopy cover (%)												

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Albrasuarina lehmanii	Allocasuarina lehmanii	5					2	3
Acacia spectabilis	Acacia spectabilis	11					2	9
Eucalyptus populnea	E. populnea	7					6	1
Callitris glaucophylla		1					1	
E. cadia		1					1	
Acacia catenulata								
Panicum whalleyan	Walwhalleya subxerophila							
A. calycina								
Lomandra patens								
Eragrostis sp.	Eragrostis sp.							
Cymbopogon refractus								
Sida fibriformis	Sida fibriformis							
Chrysanthes sieberi ssp.	Sieberi							
Dichanthium sericeum	Dichanthium Sericeum							

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	163	164	165	166	167	
Native perennial grass	80	45	80	55		
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)		30				
Non-native grass						
Non-native forbs and shrubs						
Litter	10	10	10	25		
Rock						
Bare ground	10	15	10	20		
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cbaud			
Survey result	Cbaud			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Termite mound
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment:	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
Suitable – if all 4 questions are yes	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	(Yes)	No	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Baseline Survey Form

targetzero
► zero incidents ► zero injuries

PL LAR 1214

SITE IDENTIFICATION			
Site Name:	Wallumbilla 38	Date:	16 August 2014
Tenure:	PL 193	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION					
Development Type				Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑	Well pad	☐	Gas Processing Facility	Easting (E)	216 50
☐	Pilot Well + Dam	☐	Dam	Northing (N)	7013232
☐	Monitoring	☐	Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐	Roads & Tracks	☐	Seismic Line	Other description	
☐	Work over	☐	Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 67 iP		#	
East	# 68 iP	photo fail	#	
South	# 69 iP		#	
West	# 70 iP		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	(26-75%)	>76%	n/a							
Site condition	Very good	(Good)	Moderate	Poor	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2			S1			S2		G
Avg height (m) of EDL	16m						**Avg DBH (cm) of EDL**					
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			(10-30% (sparse))			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			(Very sparse)		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa					

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S 180°	Start Easting	281657	End Easting	281645
		Start Northing	7013248	End Northing	7013200

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		10 20	3 10		1 3	0.1 1
Canopy cover (%)		25%	10%		2%	1%

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina luehmannii		25		12	12		1	
Callitris glaucophylla		6		5	1			
Acacia leiocarpa		56					48	8
A. spectabilis		11					6	5
Eucalyptus fibrosa		8		6			1	1
E. ecrebra		9		8			1	
E. populnea		1		1				
Entolasia stricta								
Aristida spp.								
Opuntia tomentosa								
Lomandra patens								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
▶ zero incidents ▶ zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	71 iP	72iP	74 iP	75iP	76iP	
Native perennial grass				2	15	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	95	100	100	98	85	
Rock						
Bare ground	5					
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.5/11.7.7/11.7.4	NA	LC	NOC
Survey result	11.7.7	NA	LC	NOC
Agree with mapped RE? If no, provide justification from field data	Yes.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	6	No. of hollow logs	0	Total length of logs (>10cm)	7	No. of logs (>10cm)	2
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Tracks and					
Large Tree					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remnt veg
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes)/No		Is the vegetation suitable for slashing only?
	Yes/No		Is the slope < 5%?
	(Yes)/No		Is the clay content > 20%?
	(Yes)/No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	Remnt veg
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

LAR 1214

SITE IDENTIFICATION			
Site Name:	Wyalla 29	**Date:**	13 August 2019
Tenure:	PL 293	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	282358
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7015523
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 174		#	
East	# 175		#	
South	# 176		#	
West	# 177		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	(Good)	Moderate	Poor	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**(WDL)**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2			S1			S2		G
Avg height (m) of EDL	10					**Avg DBH (cm) of EDL**			15			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			(10-30% (sparse))			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			~~very sparse~~		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	~~Not Found On Site~~
Weed Infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	Scatter				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	E 90°	Start Easting	282330	End Easting	282379
		Start Northing	7015529	End Northing	7015527

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		8 / 12	4 / 8		1 / 3	0-1 / 1
Canopy cover (%)		10				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina leuhmannii		27			23		4	
Callitris glaucophylla		1			1			
Acacia spectabilis		30			2		25	2
A. leiocalyx		2					1	1
Eucalyptus chlorocleda		1		1				
Angophora leiocarpa		3		3				
Aristida caput medusae								
Lomandra patens								
Cenia sub aspera								
Aristida calycina								
Sida fibulifera								
Mosses post								
Enteleia stricta								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	178	179	180	181	182	
Native perennial grass	4		10		10	
Native other grass (if relevant)				4		
Native forbs and other species (non-grass)						
Native shrubs (<1m)	20					
Non-native grass						
Non-native forbs and shrubs						
Litter	76	100	50	96	55	
Rock			5		15	
Bare ground			35		20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4/11.7.5/11.7.7	5a/10/4a Mi	LC	NOC
Survey result	11.5.1 HVR	NA	LC	NOC
Agree with mapped RE? If no, provide justification from field data	Mapped 11.5.1 HVR by 3D Ecosmart			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	1	Total length of logs (>10cm)	5.5	No. of logs (>10cm)	2
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
loss					
long fur					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Tall trees land a mark
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

LAR 1214

Tie-in to Wall 29

A 1.1 Sheet D – Regional Ecosystem type assessment site

Location

Site No. 1 **Recorder:** Peter Hall **Day/Date:** 13 August 2019

Purpose Assess RE on ROW

Locality: (inc. distance/direction to nearest town)

GPS: Zone 56 E 0281898 N 7015572

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	14	10 - 15	V
T1	7	8 - 10	M
T2		-	
T3		-	
S1		0.5 - 3	V
S2		-	
G		-	

Structural formation: (including height)

OF

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; ***c*** – co-dominant; **s** - subdominant, ***a*** – associated.

Str.	Rel. dom.	Scientific Name
E	d	Eucalyptus populnea
E	a	E. crebra
E	a	E. woollsiana
T1	d	Allocasuarina luehmannii
T1	a	E. crebra
S2	d	Acacia spectabilis
S1	a	A. leiocarpa
S1		Juvenile

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: Qa - Clay, silt, sand and gravel: Flood plain alluvium

Land system: Mild slope

Landform: ~~Mid~~ Mild slope.

Soils: Sandy clay loam. Rele

Field observation and notes: Photo 170N, 171E, 172S, 173W

Landzone: 5

RE code changes

Existing RE code: 11.5.1

Proposed RE code: 11.5.1

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

CAR 12 14

SITE IDENTIFICATION			
Site Name:	Wyalla 37	Date:	12 August 2019
Tenure:	~~PL 493~~ PL 493	Assessor(s):	Pete Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility	Easting (E)	262675
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7014135
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: (55) or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 127		#	
East	# 128		#	
South	# 129		#	
West	# 130		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	(Pale)	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	('Sandy loam')	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	(1-25%)	26-75%	>76%	n/a							
Site condition	Very good	(Good)	Moderate	Poor	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	(**FOR**)	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2		S1		S2			G	
Avg height (m) of EDL	8m					**Avg DBH (cm) of EDL**		/0				
Canopy cover (%) of EDL	>70% (dense/closed)		(30-70% (mid-dense))			10-30% (sparse)		<10% (very sparse)			n/a	
Functional shrub layer density (<2m)	Dense/closed		Mid-dense			Sparse		(Very sparse)			Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	0° N	Start Easting	282472			End Easting	282477				
		Start Northing	7014108			End Northing	7014158				
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)			5	10	3	5			1	3	0.1	1
Canopy cover (%)			50									

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Albizia suerinii		83		74	2		4	3
Callitris glaucophylla		13			2		11	
Acacia spirabilis	Acacia spirabilis	23			5		12	6
Cohnia aspera	Cohnia aspera							
Aristida caput-medusae	Aristida caput-medusae							
A. calycina	A. calycina							
Lomandra patens	Lomandra patens							
Finbristylis dichotoma	Finbristylis dichotoma							

Bull ck
T. S1 S2
40 1+3 3
5+9
x̄
s.d.

B=P
T2 S1
2 10
+1

A S
T2 S1 S2
3 9 6
2 3

Ecological Field Survey [illegible]

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	. T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	131	132	133	134	135	
Native perennial grass			20		~~60~~ 5	
Native other grass (if relevant)	2	5				
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	98	40	40	90	90	
Rock		55	30	10		
Bare ground					5	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Eakyan ?			
Survey result	Regrowth 11.5.1			
Agree with mapped RE? If no, provide justification from field data	Mapped regrowth 11.5.1 Gs 3D Ecosmart			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)		No. of hollow logs	1	Total length of logs (>10cm)	1	No. of logs (>10cm)	6
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	~~Absent~~	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	**Likely Species/Group**	**Conservation Status (see below)**	**Coordinates (GDA94)**		**Other Information (e.g. age, collected, active/inactive)**
			Easting	**Northing**	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	to (1 tree)
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / ~~(No)~~ Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	Tirtled Timbered. Sandy Soil
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Scored

Ecological Field Survey

targetzero

LAR 1214

SITE IDENTIFICATION			
Site Name:	Wyalla 28	Date:	30 July 2019
Tenure:	PL 493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	2818 ~~[illegible]~~ 48
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7014758
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: (55) or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 1		#	
East	# 2		#	
South	# 3		#	
West	# 4		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)		Moderately sloping (5-10%)		Strongly sloping (11-24%)		
	Moderately steep (25-38%)	Steep (39-55%)		Very steep (56-100%)		Slope >100% (45°)		
Aspect	N	S	E	W	NE	NW	SE	SW	(Nil)
Soil Colour	White	Yellow	Orange	Brown	Red			
	Black	Grey	(Pale)	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	(Sandy loam')	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered		Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	(Logging)	Thinning	No disturbance						
Dieback	(0%)	1-25%	26-75%	>76%	n/a							
Site condition	Very good	(Good)	Moderate	Poor	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Regrowth and remnant 11.5.1											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**(FOR)**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2		S1			S2			G
Avg height (m) of EDL	9					**Avg DBH (cm) of EDL**			10 cm			
Canopy cover (%) of EDL	>70% (dense/closed)			(30-70% (mid-dense))		10-30% (sparse)			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			(Very sparse)			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	(Found on Site – records below)	Not Found On Site
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	Scattered/Low				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within ~~50m x 10m transect~~) 50 x 5m transect

Transect Start compass bearing	E 90°	Start Easting	028~~18~~40 ~~/~~ 282901	End Easting	28 28 46
		Start Northing	7014788	End Northing	7014773

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)	14 / 14	6 / 11	/	/	1 / 3	0.1 / 1
Canopy cover (%)	>2%	50%			>1%	>1%

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina leuhmannii		~~2~~ 137		~~1~~ 97			22	18
Eucalyptus cneba		1	1					
Acacia telocalyx		2					2	
Lomandra patens								
Entolasia stricta								
~~Solanum Nitidum~~ is	Solanum	parv. foliv.						

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	5	6	7	8	9	
Native perennial grass	1				4	
Native other grass (if relevant)						
Native forbs and other species (non-grass)		4				
Native shrubs (<1m)				15		
Non-native grass						
Non-native forbs and shrubs						
Litter	99	30	80	85	86	
Rock						
Bare ground		66	20		10	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1			
Survey result	11.5.1			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	3	Total length of logs (>10cm)	19	No. of logs (>10cm)	5
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Hollow log					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Burnt log
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero

CAR 1214

SITE IDENTIFICATION			
Site Name:	Wyella 33	Date:	31 July 2019
Tenure:	PL293	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility	Easting (E)	283188
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7016552
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: (55) or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 50		#	
East	# 51		#	
South	# 52		#	
West	# ~~54~~ 53		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	(Slope or hill not specified)	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	(Pale)	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	(1-25%)	26-75%	>76%	n/a							
Site condition	Very good	(Good)	Moderate	Poor	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2		S1			S2		G	
Avg height (m) of EDL	12					**Avg DBH (cm) of EDL**			15			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		(10-30% (sparse))			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	~~ENE~~ ENE	Start Easting	283168		End Easting	283216					
		Start Northing	7016545		End Northing	7016551					
Stratum	E		T1		T2		T3		S1		S2/Seedlings
Height range (m)			12	18	4	12			1	4	01	1
Canopy cover (%)			8%		25%				2%		1%

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia leiocalyx	Acacia leiocalyx	77		9	51		11	6
Eucalyptus exserta	Eucalyptus exserta	7		5	2			
E. crebra	E. crebra	1		1				
Corymbia clarksoniana	Corymbia clarksoniana	1			1			
Parsonsia eucalyptophylla	Parsonsia eucalyptophylla	2			2			
Entolasia stricta	Entolasia stricta							
Gahnia sieberi	Gahnia aspera							
Lomandra patens	Lomandra patens							

T1 ~~Ac~~ Ac
T1 SE Ac
~~Ac~~ or Eg
Ac Eg
T1 T2
14
11
20
2
Ac
T
Rub
T1
Parsem
T1 2

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – **Denote plot type employed**					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	54	55	56	57	58	
Native perennial grass	25	20	50	10	10	
Native other grass (if relevant)				20		
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	75	60	50	60	70	
Rock						
Bare ground		20		10	20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4/11.7.7/11.7.5 Eucalypt		LC	NOC
Survey result	11.7.4			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)	Other Information (e.g. age, collected, active/inactive)
			Easting / Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remove
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-ITSM FOR 0015

LAR 1214

SITE IDENTIFICATION			
Site Name:	Wyalla 30	Date:	31 July 2019
Tenure:	PL 493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	283443
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7015680
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: (55) or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 22		#	
East	# 23		#	
South	# 24		#	
West	# 25		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	(W)	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%	26-75%	>76%	n/a		
Site condition	Very good	(Good)	Moderate	Poor	Degraded		
Fire scars	(Absent)	Scattered	Frequent	Time since	Recent	Old	Average Height (m)
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	CEST	Rf	H	FOR	(WDL)	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)		T2		S1		S2			G		
Avg height (m) of EDL	10				Avg DBH (cm) of EDL		20					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		(<10% (very sparse))			n/a		
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		(Very sparse)			Absent		

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	(Found on Site – records below)	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	Scattered / Low				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NW	Start Easting	283454	End Easting	283439
		Start Northing	7015654	End Northing	7015706

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		8 16	3 8		1 3	ol 1
Canopy cover (%)		8%.	8%.		~~1%~~ 4%.	1%

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina lehmanii		4			4			
~~Acacia decora~~ Acacia spectabilis		7			1		6	
Dodonea viscosa		13					11	2
Corymbia clacksoniana		1		1				
Geijera parviflora		2						2
Callitris glaucophylla		1			1			
Aristida caput-medusae								
Itomoeranthus melanosticta								
~~Solanum ellipticum~~	Solanum parvifolia							
~~Entolasia stricta~~	Entolasia stricta							
Sida sp	Sida sp.							
Austrostipa verticillata								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	26	27	28	29	30	
Native perennial grass	45	45	40		35	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5		5	2	5	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	10	15	20	20	20	
Rock						
Bare ground	35	35	35	78	40	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cleared	-	-	-
Survey result	cleared	-	-	-
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Large trees					
Logs					
Termite mounds					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Large trees
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

CAR1214

SITE IDENTIFICATION			
Site Name:	Wells 21	Date:	16 August 2019
Tenure:	PL 493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	283463
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7613983
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 268	All photos	#	
East	# 269	failed ~~no photos~~	#	
South	# 270		#	
West	# 271		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)		Moderately sloping (5-10%)		Strongly sloping (11-24%)		
	Moderately steep (25-38%)	Steep (39-55%)		Very steep (56-100%)		Slope >100% (45°)		
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)		Scattered		Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Deso T2											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	16				**Avg DBH (cm) of EDL**		25					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	1 o a				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect) 50 x 5m ×2

Transect Start compass bearing	S 170°	Start Easting	283471	End Easting	283661
		Start Northing	7014014	End Northing	7013966

Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)			10	18	3	10			1	3	0.1	1
Canopy cover (%)												

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia leiocalyx		22			21		1	
Corymbia clarksoniana		1		1				
Callitris glaucophylla		25		7	18			
Eucalyptus crebra		1		1				
Cochlospermum gillivraei								
Hakea stricta								

A loss
T2 S1
4
45
8
RBH
T1 T2
NR
RBH
T2 T1
9 4
9 7

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo # Photos failed	272	273	274	275	276	
Native perennial grass	20	5		15	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	70	95	95	80	80	
Rock					10	
Bare ground	10		5	5		
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4/11.7.7/11.7.5	NA	LC	NOC
Survey result	11.7.4	NA	LC	NOC
Agree with mapped RE? If no, provide justification from field data	Yes. Mapped as 11.7.4 by 3D Ecosmart.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	1	Total length of logs (>10cm)	8	No. of logs (>10cm)	3
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for **nectar / pollen**	Absent	Scattered	(Common)	Abundant
Potential for **fleshy fruiting plants**	Absent	(Scattered)	Common	Abundant
Potential for **seeding grass cover**	(Absent)	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	(Scattered)	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	(Common)	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	(Scattered)	Common	Abundant
Large rocks (>30cm)	Absent	(Scattered)	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	(Common)	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	(Common)	Abundant
Termite mounds (>50cm)	Absent	(Scattered)	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	Absent	(Scattered)	(Common)	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	(Common)	Abundant
Mistletoe/Epiphytes	Absent	Scattered	(Common)	Abundant

1H x 2 1x 4 1x2

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	N. Fee
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment:	Yes / (No)		Is the vegetation suitable for slashing only?
Suitable – if all 4 questions are yes	(Yes) / No		Is the slope < 5%?
	Yes / No		Is the clay content > 20%?
	Yes / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	✓
Notes			

Ecological Field Survey

CAR 1214

SITE IDENTIFICATION			
Site Name:	Wyalla 25	Date:	16 August 2019
Tenure:	PL 493	Assessor(s):	Peter Hill

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	283852
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7013286
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 249	photos failed	#	
East	# 250	"	#	
South	# 251	"	#	
West	# 252	"	#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	(Slope or hill not specified)	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	(W)	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('Field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	(Clearing)	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	(1-25%)	26-75%	>76%	n/a							
Site condition	Very good	(Good)	Moderate	Poor	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Area recently cleared timber stacks on site											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2			S1			S2		G
Avg height (m) of EDL	15						**Avg DBH (cm) of EDL**			20		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			(10-30% (sparse))			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Philotheca sporadica	Mig patch		283944	7013247	
Y (1)	8 8		283917	7013221	

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)											
Transect Start compass bearing	W 270°	Start Easting	283877		End Easting	283829					
		Start Northing	7013293		End Northing	7013289					
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)								1	3	0.1	1
Canopy cover (%)											

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus Cephalocarpa		4					3	1
E. fibrosa		1					1	
~~Arabai~~ Acacia leiocalyx		8					2	6
A. conferta		29					7	22
Austrostipa scabra-microcarpa								
Cheilanthes sieberi								
Lomandra patens								
Gahnia aspera								
Astroloma sp.								

NVG1

S1 S2

A. laxa S1 S2

A. rupestris S1 S2

E. fibrosa S1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	253	254	255	256	257	
Native perennial grass	10	20	35	15	65	
Native other grass (if relevant)						
Native forbs and other species (non-grass)			0			
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	45	2	45	1	15	
Rock						
Bare ground	45	78	8	84	20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cleared			
Survey result	Cleared			
Agree with mapped RE? If no, provide justification from field data				

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	6
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs.					
Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	**Likely Species/Group**	**Conservation Status (see below)**	**Coordinates (GDA94)**		**Other Information (e.g. age, collected, active/inactive)**
			Easting	**Northing**	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	~~Yes~~	~~No~~	~~Dogs~~ No if dogs are absent
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	(Yes) / No (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	(Yes)	No	
Notes			

Lease and ROW moved to avoid Philotheca sporadica

targetzero

LAR1214

SITE IDENTIFICATION			
Site Name:	Wyalla 44	Date:	30 July 2010
Tenure:	PL 493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	0283563-7014950
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: (55) or 56
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 13		#	
East	# 14		#	
South	# 15		#	
West	# 16		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	(W)	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	(Pale)	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	(1-25%)	26-75%	>76%	n/a							
Site condition	Very good	Good	(Moderate)	Poor	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2		S1			S2			G
Avg height (m) of EDL	9					**Avg DBH (cm) of EDL**			15			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		(10-30% (sparse))			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			(Mid-dense)		Sparse			Very sparse			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia stricta	scelke low				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing			Start Easting				End Easting						
			Start Northing				End Northing						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			8	12	1	6			0.1	1	0	0/	
Canopy cover (%)			12%		50%				7 2%				
Common name/collection name	Species name	Sample (Field No.)	5 Stem Count (50m x ~~10m~~ plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed										
NB: Record ground cover species within 50m x 10m transect			E		T1		T2		T3		S1		S2
		TOTALS											
Acacia leiocalyx		150					121				18		11
Eucalyptus cneba		2			2		2						
Corymbia clarksoniana		2			2								
Entolasia stricta	Entolasia stricta												
Gahnia sieberi	Gahnia aspera												
Chloris divaricata	Chloris divaricata												
Solanum biliforme	Solanum parvifolium												

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	17	18	19	20	21	
Native perennial grass	25	50	40	85	15	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	70	20	30	15	70	
Rock						
Bare ground	5	30	30		15	
Cryptogams					+	
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cleared			
Survey result	11.7.4 (HVR)	NA	LC	NOC
Agree with mapped RE? If no, provide justification from field data	No woodland to 12m high			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for **nectar / pollen**	Absent	Scattered	(Common)	Abundant
Potential for **fleshy fruiting plants**	Absent	(Scattered)	Common	Abundant
Potential for **seeding grass cover**	Absent	(Scattered)	Common	Abundant
Dense shrub/grass shelter	Absent	(Scattered)	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	(Scattered)	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	(Scattered)	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	(Scattered)	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	(Common)	Abundant
Termite mounds (>50cm)	Absent	Scattered	(Common)	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	Absent	(Scattered)	Common	Abundant
Soil cracks	(Absent)	Scattered	(Common)	Abundant
Koala feed trees	Absent	Scattered	(Common)	Abundant
Mistletoe/Epiphytes	Absent	(Scattered)	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	~~No~~	large tree
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes (No) ~~Yes~~ / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Koala Survey Datasheet

283841 7014934

Site: Wyalla 44	Date: 30 Sep 2019	Lat:	Long:
Vegetation community description: Alluvial vegetation			

Habitat Assessment (Jurskis 2001).

Canopy tree species composition	Percent canopy cover of each canopy tree species
1. Eucalyptus crebra	~~80%~~ 8 %
2. Angophora leiocalyx	~~5%~~ 0.5%
3. Corymbia citriodora	~~15%~~ 1.5%
4.	
5.	
6.	
Total Canopy Cover:	10%
Vegetation ground cover (% of the ground area):	~~70%~~ 30%
Leaf litter cover (% of the ground area):	~~50%~~ 40%
Bare ground cover (% of the ground area):	30%
Area of surface water (% of the ground area):	0
Distance (m) to surface water:	?
Evidence of dogs in the area?	Yes dingo sign
Evidence of scratches/scats (type and age)?	No

Spot Assessment Technique (Phillips & Callaghan 2011).

Number of trees with Koala scats beneath (within 1m of tree base)	0
Total number of trees surveyed	40
Proportion of trees with Koala scats beneath	0

Were any Koalas observed? If so, record where possible...

Koala's sex:	
Koala's disease status:	
Koala's reproductive status:	
Tree species:	
Tree height:	
Tree DBH:	

Photograph log.

Photo number	**Description**

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

Plots 41

LAR 1214

targetzero

SITE IDENTIFICATION			
Site Name:	Wyalla 32	Date:	31 July 2019
Tenure:	PL 493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility	Easting (E)	284290
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7016299
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: (55) or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 40		#	
East	# 41		#	
South	# 42		#	
West	# 43		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	(Clay loam)	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	(0%)	1-25%		26-75%	>76%		n/a	
Site condition	Very good	Good		(Moderate)	Poor		Degraded	
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	(**GRL**)	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2			S1			S2		(G)
Avg height (m) of EDL						**Avg DBH (cm) of EDL**						
Canopy cover (%) of EDL	>70% (dense/closed)			(30-70% (mid-dense))			10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			(Very sparse)		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia aurantica	Scatter/low				
O. stricta	11 11				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NW	Start Easting	284300 ~~284300~~	End Easting	284272
		Start Northing	7016279	End Northing	7016318

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)	1					
Canopy cover (%)	>1%					

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Buffel	Chenchrus ciliaris							
windmill grass	Chloris divicacanta							
Sporobolus creoli	Sporobolus caroli							
Digitaria sp	Brachyachne convergens							
Portulaca	Portulaca oleracea							
Mayes post	Glandularia aristigera							
Soloak kali	Salsola australe							
Honeranthus	Honoranthus melaectica							
Dog bush	Scaevolaena bixchii							
Copper bush	S. anisacanthoides							
Atriplex	Atriplex nuellevi							
Mairena	Mairenaea microphylla							
windmill grass	Chloris divicanta							
Citrus glauca	Citrus glauca L		1					

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	44	45	46	47	48	
Native perennial grass	20	30	60	35	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	50	2		35		
Native shrubs (<1m)						
Non-native grass		30			55	
Non-native forbs and shrubs			5	2	5	
Litter	10	10	5	15	10	
Rock						
Bare ground	20	28	10	13	20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cleared	—	—	—
Survey result	Cleared	—	—	—
Agree with mapped RE? If no, provide justification from field data				

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	6
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes	(No)	
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	(Yes) / No (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	(Yes)	No	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

RAM 12 14

SITE IDENTIFICATION			
Site Name:	Wyalla ~~39~~ 39	**Date:**	14 August 2019
Tenure:	PL 493	**Assessor(s):**	Pete Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	281527
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014009
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 58; P	Taken on iPhone	#	Photo Guide
East	# 59; P	"	#	
South	# 60 IIP	"	#	
West	# 61; P	"	#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	(Clearing)	Cultivation	Regrowth	(Logging)	Thinning	No disturbance		
Dieback	(0%)	1-25%		26-75%	>76%		n/a	
Site condition	Very good	Good		Moderate	(Poor)		Degraded	
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	(**GRL**)	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	(T1)	T2	S1	S2	G
Avg height (m) of EDL	8		**Avg DBH (cm) of EDL**	10	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	(<10% (very sparse))	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia stricta	Low				
O. Tomentosa	low				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	S 180°	Start Easting	281538			End Easting	281522						
		Start Northing	7014035			End Northing	7013984						
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)	3.5 - 3.5												
Canopy cover (%)	>1%												
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed										
NB: Record ground cover species within 50m x 10m transect			E		T1		T2		T3		S1		S2
		TOTALS											
Allocasuarina luehmannii		1	1										
Gladiolus acuminata													
Acacia colycina													
Sclerolaena birchii													
Eragrostis sp													

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	62.jpg	63.jpg	64.jpg	65.jpg	66.jpg	
Native perennial grass	55	45	60	49	25	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs			#	1	15	
Litter	5	5	5			
Rock	~~10~~		5			
Bare ground	40	50	30	50	60	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cleared			
Survey result	Cleared			
Agree with mapped RE? If no, provide justification from field data	yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for **nectar / pollen**	Absent	Scattered	(Common)	Abundant
Potential for **fleshy fruiting plants**	Absent	(Scattered)	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	(Common)	Abundant
Dense shrub/grass shelter	Absent	(Scattered)	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	(Scattered)	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	(Absent)	Scattered	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	(Common)	Abundant
Leaf litter depth	(Absent)	Single layer	Multiple layers	Deep layers
Leaf litter coverage	(Absent)	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	(Scattered)	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	(Absent)	Scattered	Common	Abundant
Soil cracks	(Absent)	Scattered	(Common)	Abundant
Koala feed trees	Absent	Scattered	(Common)	Abundant
Mistletoe/Epiphytes	Absent	(Scattered)	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Tracks					

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	Yes	(No)	
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	(Yes)	No	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

LAR1274

SITE IDENTIFICATION			
Site Name:	Wallo 42	**Date:**	15 August 2019
Tenure:	PL493	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	281785
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7012201
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 230		#	Photos failed
East	# 231		#	
South	# 232		#	
West	# 233		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	(Slope or hill not specified)	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	Absent		Scattered		Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	(Clearing)	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	(1-25%)	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	(Poor)	Degraded							
Fire scars	Absent	(Scattered)	Frequent	**Time since**	(Recent)	Old	**Average Height (m)**	2m				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2			S1			S2		G
Avg height (m) of EDL	9m					**Avg DBH (cm) of EDL**			24			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			10-30% (sparse)			(<10% (very sparse))		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			(Very sparse)		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Prostanthera	low				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; If confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	0° N	Start Easting	281780	End Easting	281782
		Start Northing	7012176	End Northing	7012228

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		8 11			0.1 1.0	
Canopy cover (%)		5%				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus populnea		4 ~~6~~		1			~~6~~ 3	
Acacia spectabilis	Acacia spectabilis	60					60	
Dodonaea viscosa	Dodonaea viscosa	1					1	
Aristida caput-medusae								
A calycina								
Solanum cunicle	Solanum cunicle							

PSK

DVA

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo # Photos all failed	234	235	236	237	238	
Native perennial grass	40	50	10	40	45	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	10	10	1	20	35	
Rock	trace		5			
Bare ground	50	40	85	40	20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cleared			
Survey result	Cleared			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Termite mounds					
Logs & trees					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	trees soil crush.
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes (No)		Is the vegetation suitable for slashing only?
	(Yes) No		Is the slope < 5%?
	(Yes) No		Is the clay content > 20%?
	(Yes) No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

targetzero
► zero incidents ► zero injuries

LAR1214

SITE IDENTIFICATION			
Site Name:	Wyalla 27	**Date:**	16 August 2014
Tenure:	PL 493	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	284493
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014202
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 258		#	
East	# 259		#	
South	# 260		#	
West	# 261		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	(Slope or hill not specified)	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	(N)	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	(Clearing)	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	(0%)	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	(Poor)	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	(**GRL**)	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)	T2	S1	S2	G							
Avg height (m) of EDL	16	**Avg DBH (cm) of EDL**	30									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	(<10% (very sparse))	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	~~S 170°~~ N 0°	Start Easting	284491			End Easting	284497					
		Start Northing	7014174			End Northing	7014226					
Stratum	E	T1		T2		T3		S1		S2/Seedlings		
Height range (m)		8	14					1	2-4	0.1	1	
Canopy cover (%)		18%										

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus fibrosa		2		1			1	
Acacia leiocalyx	Acacia ~~leiocalyx~~ terminalis	37					2	35
A. spectabilis	A. spectabilis	3						3
~~Pyrus~~ Pyrostegia	Pyrostegia oleifolia	8						8
Buttergrass	Chenchrus ciliaris							
Gahnia aspera								
Aristida calycina	Aristida calycina							
Solanum ferocissimum	Solanum ferocissimum							
Aristida repet modified								
Mayni pal	Glandularia aristigera							

E. tib
A. leio
S1 S2
1 1
1 1

A. spec
S2
3

Pyrostegia
S2
6
1
1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo # Photos failed	262	263	264	265	266	
Native perennial grass	2				35	
Native other grass (if relevant)			10			
Native forbs and other species (non-grass)				4		
Native shrubs (<1m)				15	10	
Non-native grass			15	2		
Non-native forbs and shrubs						
Litter	8	6	5	4	40	
Rock	15	5				
Bare ground	75	89	70	75	15	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cleared			
Survey result	Cleared			
Agree with mapped RE? If no, provide justification from field data				

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	**Likely Species/Group**	**Conservation Status (see below)**	**Coordinates (GDA94)**		**Other Information (e.g. age, collected, active/inactive)**
			Easting	**Northing**	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Timber hoops. Some large trees
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	Trees.
Notes			

Lease shifted N/ on scout to avoid retained trees.

Ecological Field Survey ORGARA-HM-FOR-0006

targetzero
► zero incidents ► zero injuries

CAR 1214

SITE IDENTIFICATION			
Site Name:	Wyalla 23	**Date:**	14 August 2019
Tenure:	PC 493	**Assessor(s):**	Pete Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	254098
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7012266
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 101 iP	(Photo Failed)	#	
East	# 102 iP		#	
South	# 103 iP		#	
West	# 104 iP		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	(Nil)
Soil Colour	White	Yellow	Orange	Brown	Red			
	Black	(Grey)	Pale	Dark	Mottled			
Soil (*field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	(Grazing)	(Forestry)	Cropping	Conservation	Mining	Other:	
Evidence	(Clearing)	Cultivation	Regrowth	(Logging)	Thinning	No disturbance	
Dieback	0%	(1-25%)	26-75%	>76%	n/a		
Site condition	Very good	Good	(Moderate)	Poor	Degraded		
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**(WDL)**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2			S1			S2		G
Avg height (m) of EDL	14					**Avg DBH (cm) of EDL**						
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			(10-30% (sparse))			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			(Very sparse)		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	low				
Special least conc					
Brachychiton populneus					

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	60° ENE		Start Easting	284072			End Easting	284118			
			Start Northing	7012257			End Northing	7012273			
Stratum	E		T1		T2		T3		S1		S2/Seedlings
Height range (m)			10	20	3	10			1	3	0.1 | 1
Canopy cover (%)			12%		12%				3%		1%

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia leiocalyx		33			24		6	3
Eucalyptus crebra		3		1	1			1
Callitris glaucophylla		10			3		5	2
Aristida caput-medusae								
Gahnia aspera								
Gahnia sp (photo)								

A L
T₂ S₁ S₂
14 1 3
81 2 2
Ne
T₁ T₁
BcP
S₁ S₂
T₂

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	105iP	106iP	107iP	108iP	109iP	
Native perennial grass	20	>30	10		15	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	10	30	70	2		
Rock						
Bare ground	70	38	20	83	75	
Cryptogams		2		15	5 10	
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4/11.7.7/11.7.5	NA	LC	Not
Survey result	11.7.7	NA	LC	Not
Agree with mapped RE? If no, provide justification from field data	~~Yes~~ Yes. Mapped 11.7.7 & 3D RE consistent.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	~~Absent~~		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	~~Scattered~~	~~Common~~	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	~~Common~~	Abundant
Potential for **seeding grass cover**	Absent	Scattered	~~Common~~	Abundant
Dense shrub/grass shelter	Absent	~~Scattered~~	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	~~Scattered~~	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	~~Scattered~~	Common	Abundant
Large rocks (>30cm)	~~Absent~~	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	~~Scattered~~	Common	Abundant
Leaf litter depth	Absent	~~Single layer~~	Multiple layers	Deep layers
Leaf litter coverage	Absent	~~Scattered~~	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	~~Common~~	Abundant
Rock piles	~~Absent~~	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	~~Common~~	Abundant
Soil cracks	~~Absent~~	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	~~Common~~	Abundant
Mistletoe/Epiphytes	Absent	Scattered	~~Common~~	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Hollow log					
+ tree					

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Lease was shifted approx 50m N for cultural Heritage purposes. To avoid a Brachychiton populnea tree

North face of the transect

South face of the transect

East face of the transect

West face of the transect

LAR 1214

SITE IDENTIFICATION			
Site Name:	Wyelle 21	Date:	16 August 2019
Tenure:	PL 493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION					
Development Type				Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility			Easting (E)	284811
☐ Pilot Well + Dam	☐ Dam			Northing (N)	7017303
☐ Monitoring	☐ Pipeline			Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line			Other description	
☐ Work over	☐ Property (area) wide				

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 244	Photos failed	#	
East	# 246	"	#	
South	# 247	"	#	
West	# 248	"	#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	(Clearing)	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	(1-25%)	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	(Poor)	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Recently cleared. heaps of ~~the~~ Pasture timber on site											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	(**GRL**)	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2		S1			S2			G
Avg height (m) of EDL	18m					**Avg DBH (cm) of EDL**			20			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		(10-30% (sparse))			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing		Start Easting	284799	End Easting	284815
		Start Northing	7013181	End Northing	~~7013230~~ 7013230

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)					1 – 3	0.1 – 1
Canopy cover (%)					10%	1%

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia aprepta	Acacia aprepta	3					1	2
Dodonaea triangularis		1						1
Acacia leiocalyx		68					6	62
Eucalyptus cneba		1					1	
Acacia confecta		6					2	4
Rhus specium (mat bush)	Prostanthera sp							
Entolasia stricta								
~~Solanum eurialis~~	Solanum euriale							
Alistida caput-medusae								
Magarey past couch	Glandularia aristigera Cynodon dactylon							
~~Glandularia aristigera~~								
Oxalis sp	Oxalis corniculata							

DT S2

A. leiocal S1 S1 S2 S-G

A. aput. S1 S2

A. conf. S1 S2

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

target zero
► zero incidents ► zero injuries

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo # Photos failed	240	241	242	243	244	
Native perennial grass			5	15	3	
Native other grass (if relevant)						
Native forbs and other species (non-grass)				3		
Native shrubs (<1m)			2	2	12	
Non-native grass						
Non-native forbs and shrubs						
Litter	1			4		
Rock						
Bare ground	99		93	76	85	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	cleared			
Survey result	cleared			
Agree with mapped RE? If **no**, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	6
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		~~Present~~	
Wetland / Swamp / Waterbody	~~Absent~~		Present	
Waterway	~~Absent~~		Present	
Potential for **nectar / pollen**	Absent	Scattered	~~Common~~	Abundant
Potential for **fleshy fruiting plants**	~~Absent~~	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	~~Abundant~~
Dense shrub/grass shelter	~~Absent~~	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	~~Scattered~~	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	~~Absent~~	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	~~Scattered~~	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	~~Common~~	Abundant
Leaf litter depth	~~Absent~~	Single layer	Multiple layers	Deep layers
Leaf litter coverage	~~Absent~~	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	~~Scattered~~	Common	Abundant
Rock piles	Absent	~~Scattered~~	Common	Abundant
Trees with shedding bark	Absent	~~Scattered~~	Common	Abundant
Soil cracks	~~Absent~~	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	~~Common~~	Abundant
Mistletoe/Epiphytes	Absent	Scattered	~~Common~~	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	**Likely Species/Group**	**Conservation Status (see below)**	**Coordinates (GDA94)**	**Other Information (e.g. age, collected, active/inactive)**
			Easting / **Northing**	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	heaps
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes (No) (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	stumps
Notes			

target zero
► zero incidents ► zero injuries

LAR 1214

SITE IDENTIFICATION			
Site Name:	Wgelk 46	**Date:**	13 August 2019
Tenure:	PL493	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	280336
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7015850
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 192		#	
East	# 193		#	
South	# 194		#	
West	# 195		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	(Very good)	Good	Moderate	Poor	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	18		**Avg DBH (cm) of EDL**	45	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	(10-30% (sparse))	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Quatia tomentosa	low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S 180°	Start Easting	280348	End Easting	280332
		Start Northing	7015870	End Northing	7015820

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		10 / 18	4 / 10		3 / 4	0.1 / 1
Canopy cover (%)		12%	20%		4	1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina leuhmannii		31			24		9	8
Eucalyptus crebra		4		1	1		2	
E. populnea		3		1				2
Acacia spectabilis		11			4		7	
A. leiocalyx		6			2		3	1
Angophora leiocarpa		2		1				1
Callitris glaucophylla		2			1		1	
Aristida calycina								
A. caput-medusae								
Cochnia aspera								
Enteleaea stricta								
Sida R. filiformis								

BO
T1 T2 68 55
S1 S2
E.cwl
T1 T2 S1
A. spp
S1 T2 3, 1
A. leiocalyx
S1 T2 S2 E3
A L
T1
BCP
T2 S1
E. pop S2
T1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	195	196	197	198	199	
Native perennial grass	20					
Native other grass (if relevant)					2	
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	20	100	100	70	98	
Rock						
Bare ground	60			30		
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4/11.7.7/11.7.1	NA	LC	NOC
Survey result	11.5.7/11.5.20	NA	LC	NOC
Agree with mapped RE? If no, provide justification from field data	Mapped 11.5.20 by 3D Ecosmart			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	13	No. of logs (>10cm)	3
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	**Likely Species/Group**	**Conservation Status (see below)**	**Coordinates (GDA94)**		**Other Information (e.g. age, collected, active/inactive)**
			Easting	**Northing**	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	To all four
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

LAR1214

SITE IDENTIFICATION			
Site Name:	Wyella ~~WP~~ 45	**Date:**	16 August 2014
Tenure:	PL 493	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	280653
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013455
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 78.tif		#	
East	# 79.tif		#	
South	# 80.tif		#	
West	# 81.tif		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (*field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion		Absent	Scattered			Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	12				**Avg DBH (cm) of EDL**		12					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	N 0°	Start Easting	280653			End Easting	280664						
		Start Northing	7013030			End Northing	7013080						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			10	18	3	10			1	3	0.1	1	
Canopy cover (%)			25%		25%				5%		1%		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia leiocalyx		89		11	10		9	59
Callitris glaucophylla		14		12	2			
A aprepta	Acacia aprepta	5			2		3	
Eucalyptus crebra		7		6	1			
E. exserta		4		2	2			
Allocasuarina luehmannii		1					1	
Entolasia stricta								
Gahnia aspera								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	86.iP	88:P	88 iP	89:P	90.P	
Native perennial grass	2	10	10	50	20	Not Eulk
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)	2	5				
Non-native grass						
Non-native forbs and shrubs						
Litter	94	80	90	50	70	
Rock						
Bare ground	2	5			10	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.1/11.7.4/11.7.5	NA	LC	Not
Survey result	11.7.7	NA	LC	Not
Agree with mapped RE? If no, provide justification from field data	~~Yes~~	mapped 11.7.7 by 3D Ecosmart		

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	1	Total length of logs (>10cm)	17m	No. of logs (>10cm)	4
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Remnant Veg.
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

. Ecological Field Survey

CAR 1214

SITE IDENTIFICATION			
Site Name:	Wyella 43	**Date:**	14 August 2019
Tenure:	PL 493	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	280585
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7012252
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 91 tif		#	
East	# 92 tif		#	
South	# 93 tif		#	
West	# 94 tif		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	(Jump-up, mesa, tableland, plateau)
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion		(Absent)	Scattered		Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	10		**Avg DBH (cm) of EDL**	10m	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Philotheca spicata	1 individual	~~280~~	280575	7012270	
" "	2		280602	7012266	
" "	1		280552	7012300	
" "	2		280578	7012307	
" "	1/2		280569 280567	7012269 7012248	
Spyridium striatum	1		280636	7012220	
P. spathulatum	~~2~~		280579	~~7012300~~	

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	S 180°	Start Easting	280564		End Easting	280870							
		Start Northing	7012259		End Northing	7012259							
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			6	12	2	6			1	2	0.1	1.0	
Canopy cover (%)			20%		4%				2%		1%		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Lysicaupus angustifolia		5		3	2			
Acacia longifolia		30		2	21		5	2
A. shirleyi		6		5	1			
Eucalyptus botryoides		4		1	3			
E. cneorifolia		1			1			
Entolasia stricta								
Aristida caput-medusae								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	95.P	96.P	97.P	98.P	99.P	
Native perennial grass	35	5	10	2		
Native other grass (if relevant)					5	
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	35	55	20	88	95	
Rock						
Bare ground	30	38	70	10		
Cryptogams		2				
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4/11.7.7/11.7.1	NA	LC	NOC
Survey result	11.7.5	NA	LC	NOC
Agree with mapped RE? If no, provide justification from field data	Yes. 3D Ecosmart maps as 11.7.7 no E. fibrosa present			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	14	No. of logs (>10cm)	5
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	(Yes)	No	Prior clearing permit
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

LAR12/6

SITE IDENTIFICATION			
Site Name:	Wsella 41	**Date:**	13 August 2019
Tenure:	PL 492	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	280830
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013966
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 215		#	
East	# 216		#	
South	# 217		#	
West	# 218		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	(W)	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	(Forestry)	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	(1-25%)	26-75%	>76%	n/a							
Site condition	(Very good)	Good	Moderate	Poor	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**(WDL)**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2			S1			S2		G
Avg height (m) of EDL	16					**Avg DBH (cm) of EDL**						
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			(10-30% (sparse))			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			(Very sparse)		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	10m				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing		Start Easting	280839			End Easting	280827						
		Start Northing	7016398395			End Northing	7016946						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			12	20	4	12			1	4	0.1	1	
Canopy cover (%)			12		18				12		1		
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed										
NB: Record ground cover species within 50m x 10m transect			E		T1		T2		T3		S1		S2
		TOTALS											
E. crebra		18			6		10				3		
Allocasuarina luehmannii		12					7				3		2
Acacia leiocalyx		45					2				39		1
A. spectabilis	Acacia spectabilis	47					3				44		
Angophora leiocarpa	Angophora leiocarpa	3			1		2						
E. woollsiana		3					1				2		
Callitris glaucophylla		1					1						
Entolasia stricta													
Bothriochloa decipiens	Bothriochloa decipiens												
Aristida calycina	Aristida calycina												
Panicum sp	Panicum sp.												
A. caput medusae	Aristida caput-medusae												
Lomandra patens	Lomandra patens												
Cathrix aspera	Cathrix aspera												

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1 →	2	3	4	5	Mean
Photo #	210	214	212	213	214	
Native perennial grass	5			5		
Native other grass (if relevant)		5				
Native forbs and other species (non-grass)						
Native shrubs (<1m)					10	
Non-native grass						
Non-native forbs and shrubs						
Litter	90	95	90	85	90	
Rock						
Bare ground	5		10	10		
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.6/11.7.7/11.5.1*	NA	LC	NOC
Survey result	11.7.7/11.5.20	NA	LC	NOC
Agree with mapped RE? If no, provide justification from field data	Yes mapped 11.7.7 by 3D Ecosmart			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	7	No. of logs (>10cm)	4
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Remnant Vegetation
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment:	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
Suitable – if all 4 questions are yes	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

SITE IDENTIFICATION			
Site Name:	GWS for HDD Warrina - Kojan Rd	Date:	2 Aug 2019
Tenure:	PL 493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	281271
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7011851
☐ Monitoring	☒ Pipeline	Datum	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 117		#	
East	# 118		#	
South	# 119		#	
West	# 120		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	(Other)						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	(1-25%)	26-75%	>76%	n/a							
Site condition	(Very good)	Good	Moderate	Poor	Degraded							
Fire scars	(Absent)	Scattered	Frequent	Time since	Recent	Old	Average Height (m)					
Disturbance notes	On Road reserve											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	CEST	Rf	H	(FOR)	WDL	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: CEST-Coastal & estuarine; Rf-Rainforest (including SEVT); H-Heath; FOR-Forest; WDL-Woodland; GRL-Grassland; IMP-Improved pasture; LKE-Lake/dam; RIP-Riparian; SHR-Shrubland; SW-Swamp/Wetland; DIS-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)		T2		S1		S2		G			
Avg height (m) of EDL	15				Avg DBH (cm) of EDL		25					
Canopy cover (%) of EDL	>70% (dense/closed)		(30-70% (mid-dense))		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		(Very sparse)		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	(Found on Site – records below)	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia stricta	Scattered				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	W	Start Easting	281288		End Easting	281234					
		Start Northing	7011854		End Northing	7011853					
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		9	18	3	9			1	3	0.1	1
Canopy cover (%)		50%		20%				2%		1%	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus populnea		29		8	12			5
Acacia decora		1			1			
A. excelsa		3			3			
Alboresicaria leichhardtii		1			1			
Gahnia sieberi	Gahnia aspera							
Aristida caput-medusae	Aristida caput-medusae							
Chloris divaricata	Chloris divaricata							
Mulga fern	Cheilanthes sieberi v sieberi							
barbwire grass	Cymbopogon refractus							
Eragrostis sp	Eragrostis sp.							
Eremophila debilis	Eremophila debilis							
Tarwood/gidgee	Acacia pendula							
Aged pest	Cladidium aristigera							

PBX
T1
T2
S1
S2
Bare T2
Bellow T2

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	121	122	123	124	125	
Native perennial grass	20	20	15	10	20	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	76	50	79	18	35	
Rock					4	
Bare ground		30		72	41	
Cryptogams	4		6			
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Category X	N/A	Category clear	Category.
Survey result	11.5.1			
Agree with mapped RE? If no, provide justification from field data	No. Area is Remnant RE 11.5.1. NOC Refer to RE assessment sheet			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	1	No. of hollow logs	3	Total length of logs (>10cm)	11	No. of logs (>10cm)	5
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	Absent		(Present)	
Potential for nectar / pollen	Absent	Scattered	Common	(Abundant)
Potential for fleshy fruiting plants	Absent	(Scattered)	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	(Common)	Abundant
Dense shrub/grass shelter	Absent	(Scattered)	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	(Abundant)
Large Non-Eucalypts (>20cm DBH)	Absent	(Scattered)	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	(Scattered)	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	(Common)	Abundant
Termite mounds (>50cm)	Absent	(Scattered)	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	Absent	(Scattered)	Common	Abundant
Soil cracks	Absent	(Scattered)	Common	(Abundant)
Koala feed trees	Absent	Scattered	Common	(Abundant)
Mistletoe/Epiphytes	Absent	Scattered	(Common)	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Hollow logs					
large trees with hollows					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	N/A not a trees
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	Not a lease
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

CARIBOU

SITE IDENTIFICATION			
Site Name:	Wyalla 49	**Date:**	31 July 2019
Tenure:	PL 493	**Assessor(s):**	Peter Bell

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0282621
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	~~6074~~ 7017346
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: (55) or 56
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 58		#	
East	# 60		#	
South	# 61		#	
West	# 62		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	(1-25%)	26-75%	>76%	n/a			
Site condition	(Very good)	Good	Moderate	Poor	Degraded			
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	(T1)	T2	S1	S2	G
Avg height (m) of EDL	16		**Avg DBH (cm) of EDL**	30	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	(10-30% (sparse))	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	(Very sparse)	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa					

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	N 0°	Start Easting	28 26 21	End Easting	28 26 21
		Start Northing	70 22 19	End Northing	70 17 74

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		11 – 20	3 – 11	1 – 3	0.1 – 1	
Canopy cover (%)		12	15	4	4	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus populnea		4		4				
Eremophila mitchellii		21			14		7	2
Atalaya hemiglauca		13			9		2	2
Cenchrus ciliaris		2					2	
Alloteropsis semialata		1					1	
Capparis lasiantha		3			1		2	
Acacia decora		3			1		2	
Entolasia stricta								
Marsdenia microphylla								
Tinospora smilacina								
Aristida caput medusae								
Sida subspicata								

Bu 4 at S1 ∞

Cap 2 at S1 T2

PBA

T1 : :

FSH

T2 S1

S2

Cen S1

Allo S1

Cap S1 T2

Acac Dec S1 T2

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	63	64	65	66	67	
Native perennial grass	15	~~20~~		20	30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)					5	
Native shrubs (<1m)						
Non-native grass			100			
Non-native forbs and shrubs						
Litter	60	20		10	20	
Rock						
Bare ground	25	60		70	45	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.9.2/11.9.7			
Survey result				
Agree with mapped RE? If no, provide justification from field data	11.5.3			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	3	Total length of logs (>10cm)	7	No. of logs (>10cm)	3
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Large trees					
hollow trees and logs					

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remnant vegetation
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

WC mapped on locale.
Not present.

A 1.1 Sheet D – Regional Ecosystem type assessment site

Wyalla 49

Location

Site No. 1 Recorder: Peter Hall Day/Date: 31 July 2019

Purpose Assess RE on Well lease Wyalla 49

Locality: (inc. distance/direction to nearest town) 30 km SE of Chinchilla

GPS: Zone 55 E 0283621 N 7017546

Vegetation structure

Median height of the EDL is to be measured

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
T1	16	11 - 22	S
T2 ~~T2~~	7	3 - 11	S
~~T2~~		-	
T3		-	
S1	2	1 - 3	V
S2		-	
G		-	

Structural formation: (including height)

Woodland

Ecologically dominant layer: T1

Plant species

Record relative (numerical) dominance for each stratum;
d – dominant; *c* – co-dominant; *s* - subdominant, *a* – associated.

Str.	Rel. dom.	Scientific Name
T1	d	Eucalyptus populnea
T2	d	Eremophila mitchellii
T2 ~~T2~~	~~s~~	Atalaya hemiglauca
S1	d	Carissa ovata
S1	a	Capparis lasiantha ssp
T1	d	Acacia decora
G		Aristida spp. Chloris sp.

Geology, landform, soils

Geology map/scale/year:

Geology code and rock types: Jw(w) Deeply weathered and kaolinised shale, siltstone, sandstone, coal seams - Walloon Coal measures

Land system:

Landform: Slope, undulating

Soils: Medium Sandy clay loam with rock

Field observation and notes: Photos 590 N, EOE, 635, 634

Landzone: 5

RE code changes

Existing RE code: 11.3.2 / 11.3.17 80/20 %

Proposed RE code: 11.5.3

END

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-0067

targetzero ► zero incidents ► zero injuries

LAR 1218

SITE IDENTIFICATION			
Site Name:	Wyella 22	Date:	15 August 2019
Tenure:	PL 493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility	Easting (E)	283060
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7012262
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 220		#	On Arrow Camera
East	# 221		#	
South	# 222		#	
West	# 213		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

Ecological Field Survey

targetzero
► zero incidents ► zero injuries

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%	26-75%	>76%	n/a		
Site condition	Very good	Good	Moderate	Poor	Degraded		
Fire scars	Absent	Scattered	Frequent	Time since	Recent	Old	Average Height (m)
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	CEST	Rf	H	FOR	WDL	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: CEST-Coastal & estuarine; Rf-Rainforest (including SEVT); H-Heath; FOR-Forest; WDL-Woodland; GRL-Grassland; IMP-Improved pasture; LKE-Lake/dam; RIP-Riparian; SHR-Shrubland; SW-Swamp/Wetland; DIS-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G		
Avg height (m) of EDL	16m				Avg DBH (cm) of EDL		20				
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a		
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent		

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia stricta	Low				
O. tomentosa	"				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S 180°	Start Easting	283066	End Easting	283062
		Start Northing	7012289	End Northing	7012247

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		10 – 20	3 – 10		1 – 3	0.1 – 1
Canopy cover (%)						

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Callitris glaucophylla		34		8	26			
Petalostigma pubescens		1			1			
Eucalyptus crebra		7		6	1			
Angophora leiocarpa	Angophora leiocarpa	2		1				1
Acacia leiocalyx		5			4		1	
Allocasuarina luehmannii		5			4		1	
Acacia conferta	Acacia conferta	4					4	
A. spectabilis	Acacia spectabilis	1					1	
Aristida caput-medusae	Aristida caput-medusae							
Chielanthes sieberi	Chielanthes sieberi v sieberi							
Entolasia stricta								
Cohi... aspera								
Antholobus	Antholobus leptomerioides							

BCP

T1 T2 S1

NKI

T1 T2

Angle

A. Pulch

T2 S1

Bayle

T2 S1 S2

A. Cw Angle

S1 T1

A. spec

S1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	224	225	226	227	228	
Native perennial grass		5		10	5	
Native other grass (if relevant)	5	5	10			
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	95	75	85	75	95	
Rock						
Bare ground		15	5	15		
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.7/11.7.4/11.7.5	NA	LC	Not
Survey result	11.7.7	NA	LC	Not
Agree with mapped RE? If no, provide justification from field data	Yes. Mapped 11.7.7 Ls 3D Ecosmart.			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	6	No. of logs (>10cm)	3
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Pygmy tree frog					
Bullfrog tass					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remnant vegetation
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Lease pad moved W. for CH reasons (avoid Petalostigma pubescens tree)

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-0001

targetzero
► zero incidents ► zero injuries

LAR 1214

SITE IDENTIFICATION			
Site Name:	Wyalla 34	Date:	1 August 2019
Tenure:	PL 493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility	Easting (E)	283572
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7017400
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 77	Photos lost on camera	#	
East	# 78	Camera faulty late date	#	
South	# 79	"	#	
West	# 80	"	#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	(Jump-up, mesa, tableland, plateau)
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)		
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%	26-75%	>76%		n/a	
Site condition	Very good	Good	Moderate	Poor		Degraded	
Fire scars	Absent	Scattered	Frequent	Time since	Recent	Old	Average Height (m)
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	CEST	Rf	H	FOR	WDL	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: CEST-Coastal & estuarine; Rf-Rainforest (including SEVT); H-Heath; FOR-Forest; WDL-Woodland; GRL-Grassland; IMP-Improved pasture; LKE-Lake/dam; RIP-Riparian; SHR-Shrubland; SW-Swamp/Wetland; DIS-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	8				Avg DBH (cm) of EDL		~10					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia stricta					

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	E 90°	Start Easting	283556	End Easting	283606
		Start Northing	7017407	End Northing	7017402

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		5 / 10			0.1 / 3	
Canopy cover (%)		9				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus obsoleta		1					1	
Grass 1.								
Alistonia constricta	Alistonia constricta	1					1	
Corymbia ovata	Corymbia ovata	4					4	
Eucalyptus crebra		7		7				
E. woollsiana		4		4				
Acacia holosericea	Acacia holosericea	1		1				
Entolasia stricta	Entolasia stricta							
Rhaphotospec.	Anthobolus leptomeroides							
Austrostipa verticillata	Austrostipa verticillata							
Goosefoot	Tetragonia tetragonoides							
Malvaceae	Malvaceae							
Photo specimen	Olearia canescens							
Sida sp	Sida sp							
Lichen	Lichens							

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	761	72	78	79	80	
Native perennial grass	20	15	55	40	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5	10			15	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	70	70	10	40	75	
Rock				20		
Bare ground	5	5	35			
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4/11.7.5/11.2.1	NA	Not	LC
Survey result	11.7.4			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	1	Total length of logs (>10cm)	6	No. of logs (>10cm)	4
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		(Present)	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for nectar / pollen	Absent	Scattered	(Common)	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	(Common)	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	(Abundant)
Dense shrub/grass shelter	Absent	Scattered	Common	(Abundant)
Large Eucalypts (>30cm DBH)	(Absent)	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	(Absent)	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	(Common)	Abundant
Small rocks (10-30cm)	Absent	Scattered	(Common)	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	(Common)	Abundant
Termite mounds (>50cm)	Absent	(Scattered)	Common	Abundant
Rock piles	Absent	Scattered	(Common)	Abundant
Trees with shedding bark	Absent	Scattered	(Common)	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	(Common)	Abundant
Mistletoe/Epiphytes	Absent	Scattered	(Common)	Abundant

targetzero
► zero worries ► zero harm

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Scats					
Large Nest					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Remnant vegetation
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Ecological Field Survey

CAR 1214

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Wells 47	Date:	13 August 2019
Tenure:	PL 493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility	Easting (E)	281465
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7015691
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 183		#	
East	# 184		#	
South	# 185		#	
West	# 186		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	(Pale)	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	(Forestry)	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	(1-25%)	26-75%	>76%	n/a							
Site condition	(Very good)	Good	Moderate	Poor	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	(**GRL**)	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	(G)
Avg height (m) of EDL	0.7		**Avg DBH (cm) of EDL**	–	
Canopy cover (%) of EDL	(>70% (dense/closed))	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	(Absent)

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	Scattered				
O. stricta	"				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)											
Transect Start compass bearing	W 270°	Start Easting	281431		End Easting	281390					
		Start Northing	7015685		End Northing	7015699					
Stratum	E		T1		T2		T3		S1		S2/Seedlings
Height range (m)											0-1 / 1-2
Canopy cover (%)											80%

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Dichanthium sericeum								
Cymbopogon refractus								
Aristida equitans/ruse								
A. calycina								
Sida filiformis								
Sclerolaena birchii								
Tufty windroll grass	Enteropogon ramosus							
Chloris divaricata								
Gandularia aristigera								
Opuntia tomentosa	Opuntia tomentosa							
Panicum decompositum								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	187	188	189	190	191	
Native perennial grass	78	90	75	80	85	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs	2					
Litter	5	5	5	10		
Rock						
Bare ground	15	5	20	10	15	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	cat 4	—	—	—
Survey result	Cleared	—	—	—
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Termite mounds					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Termite mounds
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	(Yes)	No	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

LAR 1214

SITE IDENTIFICATION			
Site Name:	Wyalla 31	Date:	30 July 2019
Tenure:	PL 493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☒ Well pad	☐ Gas Processing Facility	Easting (E)	254724
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7015352
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: (55) or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 3.1		#	
East	# 32		#	
South	# 33		#	
West	# 34		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	(Clearing)	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	(0%)	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	(Moderate)	Poor	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	(**GRL**)	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	(G)
Avg height (m) of EDL			**Avg DBH (cm) of EDL**		
Canopy cover (%) of EDL	>70% (dense/closed)	(30-70% (mid-dense))	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	Scattered/Low				
O. aurantiaca	9("				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NNE	Start Easting	254710	End Easting	254735
		Start Northing	7015306	End Northing	7015362

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)						0-? <50
Canopy cover (%)						

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Salsola kali	Selsola australe							
~~Magenta it~~	~~Aristigera~~							
NZ spinach	Tetragonia tetragonoides							
Dactyloctenium sp.	Brachyachne convergens							
Amaranthus	Homovarthus melaostica							
dog bane	Sclerolaena birchii							
Panicum sp.	Panicum sp							
Copper burr	Sclerolaena anisacanthoides							
buffel	Chenopus ciliatus							
Twinly weed with spurs	Enteropogon ramosus							
Tiger pear	Opuntia aurantiace							
Astrebla sp.	Astrebla elymoides							
Atriplex nevillei	Atriplex nevillei							
Chloris gayana	Chloris gayana							
	Glandularia aristigera							

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	35	36	37	38	39	
Native perennial grass	4	20	60	25	70	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	6	6	4	20	2	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	6	5	10	20	85	
Rock						
Bare ground	84	9	26	35	13	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cleared			
Survey result	Cleared			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes	(No)	
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	(Yes) / No (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	(Yes)	No	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero

Wyalla

SITE IDENTIFICATION			
Site Name:	EWA for WC xing	Date:	18 AUGUST 2020
Tenure:	PL493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	281057
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7014915
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	5C
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 173		#	
East	# 174		#	
South	# 175		#	
West	# 176		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion		Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	(1-25%)	26-75%	>76%	n/a			
Site condition	Very good	(Good)	Moderate	Poor	Degraded			
Fire scars	(Absent)	Scattered	Frequent	Time since	Recent	Old	Average Height (m)	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	CEST	Rf	H	FOR	(WDL)	GRL	IMP	LKE	(RIP)	SHR	SW	DIS
Key: CEST-Coastal & estuarine; Rf-Rainforest (including SEVT); H-Heath; FOR-Forest; WDL-Woodland; GRL-Grassland; IMP-Improved pasture; LKE-Lake/dam; RIP-Riparian; SHR-Shrubland; SW-Swamp/Wetland; DIS-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	(T1)		T2		S1		S2		G		
Avg height (m) of EDL	16m				Avg DBH (cm) of EDL		230				
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		(10-30% (sparse))		<10% (very sparse)		n/a		
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		(Very sparse)		Absent		

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia Lumtosa					

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NW	Start Easting	281077	End Easting	281039
		Start Northing	7014676	End Northing	7015005

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		9 | 18	2 | 9		ov | 2	
Canopy cover (%)						

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus wetsiana		14		11	3			
Eucalyptus mitchelli		7			2		5	
Acacia neriifolia		2			1		1	
Grevillea parviflora							2	
Aristida Calycina	Aristida calycina							
A. caput medusae	A. caput-medusae							
Natural grass	Cissus sp.							
Ruby saltbush	Enchylaena tomentosa							
Phyllanthus	Phyllanthus virgatus							
Climbing saltbush	Einadia nutans							
Tufty windmill grass	Enneapogon nanus							
Goodenia	Goodenia glabra							
Solanum esuriale	Solanum esuriale							

GTB
T1 T2

Acacia (from bank)
T2 S1

Grevillea
S1

E
T2 S1

Ecological Field Survey ORG-ARW-HSM-FOR-00067

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	177	178	179	180	181	
Native perennial grass	20	15	15			
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5			4		
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs		5				
Litter	60	65	60	76		
Rock						
Bare ground	15	15	25	20		
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.20			
Survey result	11.5.20			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	1	No. of logs (>10cm)	1
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		(Present)	
Wetland / Swamp / Waterbody	Absent		(Present)	
Waterway	Absent		(Present)	
Potential for nectar / pollen	Absent	Scattered	Common	(Abundant)
Potential for fleshy fruiting plants	Absent	Scattered	(Common)	Abundant
Potential for seeding grass cover	Absent	Scattered	(Common)	Abundant
Dense shrub/grass shelter	(Absent)	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	(Abundant)
Large Non-Eucalypts (>20cm DBH)	Absent	(Scattered)	Common	Abundant
Large rocks (>30cm)	Absent	(Scattered)	Common	Abundant
Small rocks (10-30cm)	Absent	(Scattered)	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	(Common)	Abundant
Termite mounds (>50cm)	Absent	(Scattered)	Common	Abundant
Rock piles	Absent	(Scattered)	Common	Abundant
Trees with shedding bark	Absent	Scattered	(Common)	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	(Abundant)
Mistletoe/Epiphytes	Absent	(Scattered)	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Large Termite Mound					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No (Yes) / No Yes / (No)		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	Not a well kept
Notes			

SITE IDENTIFICATION			
Site Name:	Wyalla satellites	Date:	18 August 2020
Tenure:	PL 253 PL 255	Assessor(s):	Pete Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	0276675
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7011904
☐ Monitoring	☒ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 162		#	
East	# 163		#	
South	# 164		#	
West	# 165		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	(Steep (39-55%))	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	(Orange)	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	(Absent)	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	(Forestry)	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	(Logging)	Thinning	No disturbance						
Dieback	0%	(1-25%)	26-75%	>76%	n/a							
Site condition	(Very good)	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	(Frequent)	**Time since**	Recent	(Old)	**Average Height (m)**	1.0m				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**(WDL)**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2			S1			S2		G
Avg height (m) of EDL	15m						**Avg DBH (cm) of EDL**			22 cm		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			(10-30% (sparse))			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	E	Start Easting	0279951		End Easting	0280001			
		Start Northing	7011907		End Northing	7011905			
Stratum	E	T1		T2		T3	S1		S2/Seedlings
Height range (m)		10	17	3	10		0.1	1	
Canopy cover (%)		21%		6%			>1%		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia leiocalyx	Acacia leiocalyx	24		15	4		5	
Angophora leiocarpa		9		7			2	
Eucalyptus crebra		10		6	1		3	
Acacia concolor		5					5	
Entolasia stricta	Entolasia stricta							
Aristida caput-medusae	Aristida caput-medusae							
Panicum sp.	Panicum sp.							

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	166	167	168	169	170	
Native perennial grass	20	35	20	5	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)	5					
Non-native grass						
Non-native forbs and shrubs						
Litter	55	60	50	80	35	
Rock						
Bare ground	20	5	30	15	55	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.7			
Survey result	11.7.7			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	1	Total length of logs (>10cm)	9	No. of logs (>10cm)	6
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for nectar / pollen	Absent	Scattered	(Common)	Abundant
Potential for fleshy fruiting plants	Absent	(Scattered)	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	(Abundant)
Dense shrub/grass shelter	(Absent)	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	(Common)	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	(Scattered)	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	(Absent)	Scattered	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	(Scattered)	Common	(Abundant)
Termite mounds (>50cm)	Absent	(Scattered)	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	(Common)	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	(Common)	Abundant
Mistletoe/Epiphytes	Absent	Scattered	(Common)	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Large trees					
logs					
Termite mounds					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	Not a well yet
Notes	Shallow soil over rock		

Ecological Field Survey

targetzero

SITE IDENTIFICATION			
Site Name:	Wyalla Cons Tower	Date:	22 Aug 2022
Tenure:	PL 493	Assessor(s):	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	287418
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7015803
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	Cons Tower
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 215		#	
East	# 216		#	
South	# 217		#	
West	# 218		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red	Black	Grey	(Pale)	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	(Absent)	Scattered	Frequent
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	(0%)	1-25%		26-75%	>76%	n/a						
Site condition	Very good	(Good)		Moderate	Poor	Degraded						
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	(**WDL**)	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	16		7		**Avg DBH (cm) of EDL**							
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		(10-30% (sparse))		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia aurantiaca					
O. stricta					

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	283423	End Easting	283412
		Start Northing	7015821	End Northing	7015779

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		10 – 18	2 – 10		0.1 – 2	
Canopy cover (%)						

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra	Eucalyptus crebra	3		2	1			
Allocasuarina luehmannii		44		2	17		25	
Acacia (Kempton)	Acacia deanei	6					6	
A. conferta	A. conferta	4					4	
A. leiocalyx	A. leiocalyx	11			1		10	
Ventilago viminalis	Ventilago viminalis	1					1	
Petrostigma pubescens		1					1	
Alstonia constricta		2					2	
Aristida caput-medusae	Aristida caput-medusae							
Eulalia leucophaea	Entolasia stricta							

NR!
T1 T2
BOA
T2 S1
T1
A. conf S1
E. leuc
A. leiocalyx
T2

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	219	220	221	222	223	
Native perennial grass	55	5		30	15	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)			10			
Non-native grass						
Non-native forbs and shrubs						
Litter	20	15	90	40	5	
Rock					2	
Bare ground	25	80		30	78	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Cleared			
Survey result	RE 11.5.3			
Agree with mapped RE? If no, provide justification from field data	No. Change of definition since ALA was ground verified. No regrowth RE 11.5.3 (Clearing) Not cleared since 2002 Ai-/nt QAP6017 Email 16/ Wed 22 July 2003			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
large trees					
termite mounds					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	large trees termite mounds
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment:	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
Suitable – if all 4 questions are yes	(Yes) / No		Is the clay content > 20%? NA
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	Not < well yet
Notes			

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero

SITE IDENTIFICATION			
Site Name:	Tong Park Pt 1	Date:	25/05/21
Tenure:	PL493	Assessor(s):	VC

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	0284317 WP006
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7012819
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 154448	VC phone	#	
East	# 154451		#	
South	# 154454		#	
West	# 154457		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content I. to R. hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	(Sandy clay loam')	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion		(Absent)		Scattered		Frequent
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-Bank

Ecological Field Survey ORG-ARW-HSM-FOR-00067

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other Easement powerline				
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance				
Dieback	0%	1-25%	26-75%	>76%	n/a					
Site condition	Very good	Good	Moderate	Poor	Degraded					
Fire scars	Absent	Scattered	Frequent	Time since	Recent	Old	Average Height (m)			
Disturbance notes	Cleared with native regrowth & ground cover									

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Macrohabitat(s) present	CEST	Rf	H	FOR	WDL	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: CEST-Coastal & estuarine; Rf-Rainforest (including SEVT); H-Heath; FOR-Forest; WDL-Woodland; GRL-Grassland; IMP-Improved pasture; LKE-Lake/dam; RIP-Riparian; SHR-Shrubland; SW-Swamp/Wetland; DIS-Disturbed areas (e.g. roadsides, cropping land, urban areas).										
Ecologically dominant layer (EDL)	T1			T2			S1		S2	G
Avg height (m) of EDL	1.8					Avg DBH (cm) of EDL			4.7	
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			10-30% (sparse)		<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse		Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	E	Start Easting	0284293 WP004	End Easting	0284340 WP005
		Start Northing	7012814	End Northing	7012824

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)					0.5 | 6	0.3 | 0.5
Canopy cover (%)					20	—

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
	Allocasuarina littoralis	6					IIII I	
	Eucalyptus cinerea	10					IIII IIII	
	Acacia leiocalyx subsp. leiocalyx	32					IIII IIII IIII IIII	IIII IIII
	Acacia lineata	24					IIII IIII IIII IIII	IIII
Aristida sp.								
Sida sp.								
Oxalis corniculata								
Cymbopogon refractus								
Eberlanzia sieberi								
Melinis repens								
Aristida caput-medusae								
Megathyrsus maximus								
Wahlenbergia subcapitata								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

Ecological Field Survey DRG-ARW-HSM-FOR-00007

targetzero

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	153936	154043	154221	154624	154750	
Native perennial grass	95	85	80	20	90	74
Native other grass (if relevant)						
Native forbs and other species (non-grass)					10	2
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	5	5	15	78		20.6
Rock						
Bare ground		10	5	2		3.4
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

vphase

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	non-rem			
Survey result	non-rem			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)		No. of hollow logs		Total length of logs (>10cm)	10	No. of logs (>10cm)	2
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	200	Per hectare (x 20)	40

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

Ecological Field Survey ORG-ARW-HSM FOR-0006?

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	Special Least Concern Species Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	Colonial Breeding Species Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	Yes	(No)	
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero

SITE IDENTIFICATION			
Site Name:	Tong Park Pt2	Date:	26/05/21
Tenure:	PL194	Assessor(s):	VC

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	0285206 WP011
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7012911
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	#090505	VCPh	#	
East	#090508		#	
South	#090511		#	
West	#090514		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red			
	Black	(Grey)	Pale	Dark	Mottled			
Soil (*field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

Ecological Field Survey ORG-ARW-HSM-FOR-00067

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: cleared farmland						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	Time since	Recent	Old	Average Height (m)					
Disturbance notes	Acacia sl + TV die back prominent											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	CEST	Rf	H	FOR	WDL	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: CEST-Coastal & estuarine; Rf-Rainforest (including SEVT); H-Heath; FOR-Forest; WDL-Woodland; GRL-Grassland; IMP-Improved pasture; LKE-Lake/dam; RIP-Riparian; SHR-Shrubland; SW-Swamp/Wetland; DIS-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2			S1			S2		G
Avg height (m) of EDL	15					Avg DBH (cm) of EDL			24			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey ORG-ATW-HSM-FOR-00367

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)							
Transect Start compass bearing	W	Start Easting	0285228 WP009	End Easting	0285185 WP010		
		Start Northing	7012929	End Northing	7012901		
Stratum	E	T1	T2	T3	S1		S2/Seedlings
Height range (m)		12 | 17	5 | 10		0.5	6	
Canopy cover (%)		20	10		20		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
	Eucalyptus crebra	13		IIII	I			
Sp 1 (2)	Acacia decurrens subsp. decurrens	2					II	
	Acacia leiocalyx	54			II		IIII IIII IIII IIII	I
	Acacia excelsa	6						
	Melaleuca Corymbia tesselaris	1			I			
	Cyperus sp.							
	Cymbopogon refractus							
	Aristida sp.							
	Solanum sp.							
	Alloteropsis semialata							
	Aristida caput-medusae							
Mistletoe	Amyema conspicua							

Ecological Field Survey ORG-ARW-HSM-FOR-00067

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

Ecological Field Survey ORG-ARW-HSM-FOR-0006?

targetzero

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	090037	090218	090344	090707	090841	
Native perennial grass	50		5		7	12.4
Native other grass (if relevant)						
Native forbs and other species (non-grass)		3		15	3	4.2
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	50	93	85	80	90	79.6
Rock						
Bare ground		4	10	5		3.8
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

Vc pk

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1regrowth			
Survey result	11			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)		No. of hollow logs		Total length of logs (>10cm)	22	No. of logs (>10cm)	9
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	440	Per hectare (x 20)	180

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seedling grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

Ecological Field Survey ORG-ARW-HSM-FOR-00067

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Diggings	Short beaked echidna	SLC	Scattered in ESU		

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	Water Tank	**Date:**	19 August 2021
Tenure:	PL 253	**Assessor(s):**	Peter Hall

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	280012
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7011945
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☒ Roads & Tracks	☐ Seismic Line	**Other description**	water tank
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 236		#	
East	# 237		#	
South	# 238		#	
West	# 239		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	(Top, crest of mountain or ridge)	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	(Clay loam sandy)	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	1.5				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2			G
Avg height (m) of EDL	9					**Avg DBH (cm) of EDL**			18			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	S/L				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	N	Start Easting	280013	End Easting	280015
		Start Northing	7011971	End Northing	7012013

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		6 / 11	2 / 6		1 / 2	0.1 / 1
Canopy cover (%)		30				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus exserta		31		31				
E. crebra		2		2				
Acacia leiocalyx		36					7	29
A. implexa		4		1	3			
Angophora leiocarpa		1		1				
Corymbia clarksoniana		1		1				
Alphitonia excelsa		1						1
Entolasia stricta								
Lomandra longifolia								
Aristida cap. + nodes								
Chiloglottis sieberi								
Melichrus erubescens	Melichrus erubescens							

1 1x1 1.5

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	240	241	242	243	244	
Native perennial grass	10	25	60	80	50	
Native other grass (if relevant)	30					
Native forbs and other species (non-grass)			5			
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	60	75	35	20	50	
Rock						
Bare ground						
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.7			
Survey result	11.7.7			
Agree with mapped RE? If no, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	10	No. of logs (>10cm)	2
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	~~Absent~~		Present	
Wetland / Swamp / Waterbody	~~Absent~~		Present	
Waterway	~~Absent~~		Present	
Potential for nectar / pollen	Absent	Scattered	~~Common~~	Abundant
Potential for fleshy fruiting plants	~~Absent~~	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	~~Abundant~~
Dense shrub/grass shelter	Absent	Scattered	~~Common~~	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	~~Common~~	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	~~Scattered~~	Common	Abundant
Large rocks (>30cm)	Absent	~~Scattered~~	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	~~Common~~	Abundant
Leaf litter depth	Absent	Single layer	~~Multiple layers~~	Deep layers
Leaf litter coverage	Absent	Scattered	Common	~~Abundant~~
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	~~Absent~~	Scattered	Common	Abundant
Trees with shedding bark	Absent	~~Scattered~~	Common	Abundant
Soil cracks	~~Absent~~	Scattered	~~Common~~	Abundant
Koala feed trees	Absent	Scattered	~~Common~~	Abundant
Mistletoe/Epiphytes	Absent	~~Scattered~~	Common	Abundant

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other					
Fauna Sign / Breeding Place	**Likely Species/Group**	**Conservation Status (see below)**	**Coordinates (GDA94)**		**Other Information (e.g. age, collected, active/inactive)**
			Easting	**Northing**	
Logs for logs					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	tree's
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	See above
Notes			

SITE IDENTIFICATION			
Site Name:	K5 KNJV-T1	Date:	4/04/24
Tenure:	PL194	Assessor(s):	Kye Chamberlain

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	0287561
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7011859
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 19		#	
East	# 20		#	
South	# 21		#	
West	# 22		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	Absent	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: fuel?	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	<1-25%	26-75%	>76%	n/a		
Site condition	Very good	Good	Moderate	Poor	Degraded		
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1		S2			G	
Avg height (m) of EDL	8					**Avg DBH (cm) of EDL**		25				
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)			n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse		Very sparse			Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	163°	Start Easting	1291571	End Easting	0291532
		Start Northing	7011873	End Northing	7011827

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		7 | 8	5 | 7		1 | 3	0.5 | 1
Canopy cover (%)		50	10		20	10

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus urophylla				6	11			
Euc. pellita					1			
Acacia mangium							41	41
Acacia crassicarpa							6	31
Prostanthera sp. - Prostanthera cuneifolia subsp. cuneifolia								1
Acacia aulacocarpa								
Dillenia hypoleuca							11	2
Allocasuarina huegeliana							1	
Leucopogon sp.								
Panicum sp. - Panicum decompositum								

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targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

targetzero ► zero incidents ► zero injuries

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	23	24	25	26	27	
Native perennial grass	50	20	60	20		30
Native other grass (if relevant)						
Native forbs and other species (non-grass)		20				4
Native shrubs (<1m)	5					1
Non-native grass						
Non-native forbs and shrubs	1	1				0.4
Litter	44	54	40	50	65	55.6
Rock				[illegible]	5	1
Bare ground				30	10	6
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1	[illegible] –	LC	NIAP
Survey result	11.6.1	–	LC	NCAP
Agree with mapped RE? If no, provide justification from field data				

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)		No. of hollow logs		Total length of logs (>10cm)	3	No. of logs (>10cm)	1
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	60	Per hectare (x 20)	20

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Scats	Macropods	LC			
Nest	Unknown bird	LC	0281578	7014833	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	hollows present
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	bird nest present
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes (No) Yes (No) Yes (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	K7 KNJV-T2	**Date:**	16/04/24
Tenure:	PL194	**Assessor(s):**	KyC

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0252630
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7012218
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 28		#	
East	# 29		#	
South	# 30		#	
West	# 31		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	Absent	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	CEST	Rf	H	FOR	WDL	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	10				**Avg DBH (cm) of EDL**		20					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; If confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	76°	Start Easting	282793	End Easting	282850
		Start Northing	7012200	End Northing	7012229

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		9 11	6 8		1.5 3	0.7 1.5
Canopy cover (%)		35	7		2	0.7

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus sebra				1,1				
Cenchrus clandestinum					1,1			
Acacia [illegible]							1,6,2,3,3	2,1
Acacia [illegible]							1,2,3,2	1,3,6,6
Callitris glaucophylla					2,5			
Grass blunt-tipped leaves								2,1
Lysiocaryos angustifolius					1			
Panicum 3 sp. – Panicum decompositum								
Callitris sp. (white) – Brachyscome multifida								
Asteraceae sp. (yellow) – Xerochrysum bracteatum								
Acacia [illegible]								
Callitris verrucosa								
Eucalyptus fibrosa				1				

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Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	32	33	34	35	36	
Native perennial grass	10	10	5	30	25	16
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5		1	1	10	3.4
Native shrubs (<1m)	1	5			1	1.4
Non-native grass						
Non-native forbs and shrubs	3		5		1	1.2
Litter	42	~~35~~ 55	84	69	58	57.6
Rock						
Bare ground	42	50	5		5	20.4
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.7	-	LC	NCAP
Survey result	11.7.7	-	LC	NCAP
Agree with mapped RE? If no, provide justification from field data				

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	1	No. of hollow logs	/	Total length of logs (>10cm)	17	No. of logs (>10cm)	5
Per hectare (x 20)	20	Per hectare (x 20)	/	Per hectare (x 20)	340	Per hectare (x 20)	100

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	0	No. of trees with hollows (>30cm)	0

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Large trees, one w/ hollow	Small birds/parrots				

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Arboreal life present
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	small hollow, greater glider habitat
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Greatly disturbed, many pushed trees from adjacent powerline easement.
Lz 7.

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-0006?

targetzero

SITE IDENTIFICATION			
Site Name:	KI TWRP-T1	**Date:**	15/04/24
Tenure:	PL294	**Assessor(s):**	Nge Chamberlain

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0280922
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7012027
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 1		#	
East	# 2		#	
South	# 3		#	
West	# 4		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:					
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance					
Dieback	0%	1-25%	26-75%	>76%	n/a						
Site condition	Very good	Good	Moderate	Poor	Degraded						
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**				
Disturbance notes											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1	T2	S1	S2	G						
Avg height (m) of EDL	10		**Avg DBH (cm) of EDL**	25							
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a						
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent						

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Philotheca sporadica	Low		250959.78	7012032.0	

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	290°	Start Easting	0280922	End Easting	0280908
		Start Northing	7011988	End Northing	7012008

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		10 ~~11~~	4 8	3 4	0.6 2	
Canopy cover (%)		50	10	10	5	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Callitris glaucophylla				1,3				
Alocasuarina huegeliana					3			
Acacia victoriae						2	2,5, 2, 3	
Acacia colei					~~3~~		9,6,2	
Calitris curvifolia				3				
Cheilanthes sp.								
Acacia sp. (bipinnate) - Acacia sp. (Cens Ha)								
Panicum ? sp. - Panicum decompositum								
~~Dianella sp.~~ Lomandra ~~longifolia~~ sp.								
Asteraceae sp. (sterile)								
Exocarpos aphyllus								
Eucalyptus coolabah				1				
Acacia ligulata-related								
Eucalyptus flocktoniae				1, 2, 1	4	1		
Glycine sp.								
Corymbia citriodora				2				
Dodonaea viscosa subsp. angustissima								
Acacia sp.								
Solanum sp. - Solanum ellipticum								
Paspalidium sp.								
Cassia cf. helmsii ?								

Common name/collection name	Species name	(Field No.)	(50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Dodonaea triquetra								
Hairy casuarina – Allocasuarina inophloia					1	4,1,1		

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	5	1	2	8	9	
Native perennial grass	10	15	~~25~~	30	20	15
Native other grass (if relevant)						
Native forbs and other species (non-grass)		20	15	5	20	12
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs	5					1
Litter	75	65	85	60	30	63
Rock						
Bare ground	10				30	8
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.7	–	LC	NCAP
Survey result	11.7.7	–	LC	NCAP
Agree with mapped RE? If no, provide justification from field data	Yes.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)		No. of hollow logs		Total length of logs (>10cm)	2	No. of logs (>10cm)	ww 1
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	40	Per hectare (x 20)	ww 20

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	none	No. of trees with hollows (>30cm)	none

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.
Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
none					

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Arboreal fauna structures
Ecologist	(Yes)	(No)	Protected plants
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	Yes / (No)		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey

SITE IDENTIFICATION			
Site Name:	K4 TWRP-T2	Date:	15/04/24
Tenure:	PL194	Assessor(s):	[illegible]

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	0281363
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7011867
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 9 10		#	
East	# 6 11		#	
South	# 7 12		#	
West	# 8 13		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	(Grey)	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	(Clay loam')	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: Easement	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	<1-25%	26-75%		>76%	n/a	
Site condition	Very good	Good	Moderate		Poor	Degraded	
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	0-7				**Avg DBH (cm) of EDL**		–					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		<Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	110°	Start Easting	281362			End Easting	281376				
		Start Northing	7011864			End Northing	7011853				
Stratum	E		T1		T2		T3		S1		S2/Seedlings
Height range (m)	12	12							C5	7	0	0.7
Canopy cover (%)	2								5-10		100

Grass

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Bothriochloa pertusa								
Cyperus sp.								
Dichanthium sp.								
Chloris truncata								
Acacia crassa							2	
Eucalyptus tetrodonis			1				3, 1	
Melaleuca leucadendra							1	
Eucalyptus papuana							3, 1, 1	
Petalostylis sp.								
Erythrolaena wistiae								
Pandanus sp.								
Acacia sp. Hispidula							3, 1, 1	
Eragrostis sp.								
Sporobolus sp. (tufted)								
Buchanania sp.							1	
Pachynema sp.								
Sida sp. ~~Hirsutum~~ Fx – Sida cunninghamii								

Ecological Field Survey ORG-ANW-HSM-FOR-00[illegible]

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	14	15	16	17	18	
Native perennial grass	100	84	95	69	10	71.6
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs		1		1	5	1.2
Litter		10	5			3
Rock						
Bare ground		5			85	18
Cryptogams				30		6
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1	-	LC	NCAP
Survey result	cleared	-	LC	NCAP
Agree with mapped RE? If no, provide justification from field data	No. Evidently cleared area with very few remnant trees present aby bridge line			

FAUNA HABITAT within 50m x 10m transect						
No. of trees with hollows (>10cm)		No. of hollow logs		Total length of logs (>10cm)		No. of logs (>10cm)	
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Frogs Calls	Frogs				

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Frogs present
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	"
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	TWRP-T3	**Date:**	15 April 2024
Tenure:	PL194	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	281182
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7011943
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#1		#	
East	#2		#	
South	#3		#	
West	#4		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain ✓	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	Level (<1%)	Gently sloping (1-4%) ✓	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	N ✓	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale	Dark ✓	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’ ✓	**‘Loam’**	**‘Silty loam’**			
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**			
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)					
Erosion	Absent ✓	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging ✓	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate ✓	Poor	Degraded							
Fire scars	Absent ✓	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ✓	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1 ✓	T2	S1	S2	G							
Avg height (m) of EDL	8			**Avg DBH (cm) of EDL**	20							
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense) ✓	10-30% (sparse)	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse ✓	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below ✓	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	32 N		Start Easting	2811202			End Easting	281159					
			Start Northing	7011959			End Northing	7011936					
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			8	15	4	6			1	2	0.1	1.0	
Canopy cover (%)			20		10				5		5		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus populnea		17		14	3			
Allocasuarina luehmannii		15			15			
Eucalyptus crebra		9		7	2			
Acacia crassa		9					9	
Sida hackettiana								
Eragrostis elongata								
Cyperus eragrostis								
Chrysocephalum apiculatum								
Opuntia tomentosa								
Calotis cuneifolia								
Aristida caput-meduseae								
Nyssanthes diffusa								
Gahnia aspera								
Hypochaeris albiflora								
Sida cordifolia								
Cymbopogon refractus								
Evolvulus alsinoides								
Brachyscome multifida								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	5	6	7	8	9	
Native perennial grass	60	50	40	30	70	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	10	10	20		
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	20	30	40	30	20	
Rock						
Bare ground	10	10	10	10	10	
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1	NA	LC	NCAP
Survey result	11.5.1	NA	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data				

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	1	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	20	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common ✓	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common ✓	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common ✓	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common ✓	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered ✓	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common ✓	Abundant
Soil cracks	Absent	Scattered ✓	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant ✓
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	NA	**No. of trees with hollows (>30cm)**	NA

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Log	Small mammals / reptiles				
Hollows	Small mammals / reptiles				

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Threatened Species
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ Yes / No ✓ Yes / No ✓ ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No ✓	
Notes			

Remnant vegetation that offer Core Habitat possibel for Furina dunmalli and Nyctophilus corbeni. Also, the RE is General habitat possible for Hemiaspis damelii and Phascolarctos cinereus.

No habiat feature for H. damelli was recorded or evidence of P. cinereus is using the location.

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	TWRP-t4	**Date:**	15 April 2024
Tenure:	PL194	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	280266
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7012977
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 16		#	
East	# 17		#	
South	# 18		#	
West	# 19		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified ✓	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	Level (<1%)	Gently sloping (1-4%)✓	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	N	S	E	W ✓	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey ✓	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’	‘Loam’	‘Silty loam’			
	‘Sandy clay loam’ ✓	‘Clay loam’	‘Clay loam sandy’	‘Silty clay loam’	‘Light clay’	‘Light medium clay’			
	‘Medium clay’	‘Medium heavy clay’	‘Heavy clay’	(Saline mud)					
Erosion	Absent ✓	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging ✓	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate ✓	Poor	Degraded							
Fire scars	Absent ✓	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR** ✓	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	10				**Avg DBH (cm) of EDL**		25					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% ✓ (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse ✓		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below	Not Found On Site ✓

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	102 w		Start Easting	280295			End Easting	280248				
			Start Northing	7011985			End Northing	701991				
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)			8	15	4	8			1	2	0.1	1
Canopy cover (%)			20		10				10		10	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus fibrosa		26		17	9			
Corymbia clarksoniana		11		4	7			
Angophora leiocarpa		6		6				
Acacia crassa		27					27	
Lysicarpus angustifoloius								
Evolvulus alsinoides								
Nyssanthes diffusa								
Dianella longifolia								
Solanum nemophilum								
Lomandra logifolia								
Sida hackettiana								
Calotis cuneiflora								
Oxalis corniculata								
Hypochaeris albiflora								
Aristida caput-medisae								
Cheilandthes sieberi								
Goodenia pardoxa								
Sida cordifolia								
Gahnia aspera								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	20	21	22	23	24	
Native perennial grass	20	10	60	20	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	20	10	10	10	
Native shrubs (<1m)	10					
Non-native grass					20	
Non-native forbs and shrubs		10		20		
Litter	50	20	20	40	60	
Rock						
Bare ground	10	40	10	10		
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.7.7	NA	LC	NCAP
Survey result	11.7.7	NA	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	Yes.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	1	**No. of logs (>10cm)**	2
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	20	**Per hectare (x 20)**	40

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant ✓
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant ✓
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered ✓	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered ✓	Common	Abundant
Large rocks (>30cm)	Absent	Scattered ✓	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered ✓	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common ✓	Abundant
Soil cracks	Absent	Scattered ✓	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant ✓
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	NA	**No. of trees with hollows (>30cm)**	6

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Hollow	Small mammals				
Diggings	Small mammlas / birds				
Scratches	Reptiles				

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Threatened species
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No ✓ Yes / No ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No ✓	
Notes			

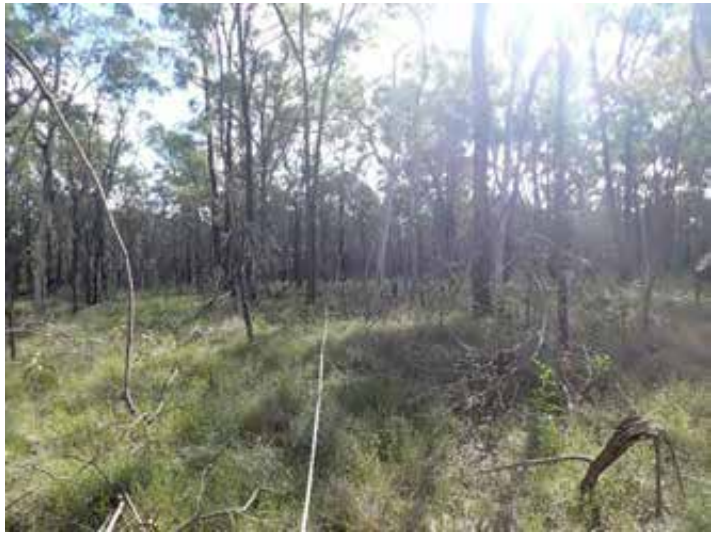
Protected plant surveys was conducted on the area. No records for Philotheca sporadica or Eucalyptus curtisii on the location.

Philotheca sporadica was record near by the area.

RE is a core habitat for Acanthiphis antarcticus, Furina dunmalli and Phascolarctos cinereus. P. cinereus survey was conducted and not evidence of the species on the location surveyed.

North face of transect

East face of the transect



South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	TWRP-T5	**Date:**	15 April 2024
Tenure:	PL194	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	281291
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7011914
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56 ✓
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 24		#	
East	# 25		#	
South	# 26		#	
West	# 27		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain ✓
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%) ✓	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE ✓	SW	Nil
Soil Colour	White	Yellow	Orange	Brown ✓	Red				
	Black	Grey	Pale	Dark ✓	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’ ✓	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent ✓	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging ✓	Thinning	No disturbance						
Dieback	0% ✓	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate ✓	Poor	Degraded							
Fire scars	Absent ✓	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR** ✓	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1 ✓	T2	S1	S2	G							
Avg height (m) of EDL	8			**Avg DBH (cm) of EDL**	25							
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense) ✓	10-30% (sparse)	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below ✓	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	SE		Start Easting	281300			End Easting	281276					
			Start Northing	7011943			End Northing	7011878					
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			8	15	2	7			1	2	0.1	1	
Canopy cover (%)			20		10				5		5		
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed										
NB: Record ground cover species within 50m x 10m transect			E		T1		T2		T3		S1		S2
		TOTALS											
Eucalyptus populnea		30			30								
Callitris glaucophylla					5						6		
Cymbopogon refractus													
Sida cordifolia													
Panicum queenslandeicum													
Opuntia tomentosa													
Gomphrena celosioides													
Wahlenbergia gracilis													
Glandularia aristigera													
Eragrostis elongata													
Nyssanthes diffusa													

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	28	29	30	31	32	
Native perennial grass	50	30	20	70	20	
Native other grass (if relevant)						
Native forbs and other species (non-grass)		10			10	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	40	50	70	20	60	
Rock						
Bare ground	10	10	10	10	10	
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1	NA	LC	NCAP
Survey result	11.5.1a	NA	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	8	**No. of logs (>10cm)**	2
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	160	**Per hectare (x 20)**	40

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common ✓	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common ✓	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered ✓	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant ✓
Large Non-Eucalypts (>20cm DBH)	Absent ✓	Scattered	Common	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common ✓	Abundant
Soil cracks	Absent	Scattered	Common ✓	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant ✓
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	NA	No. of trees with hollows (>30cm)	NA

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Soil crack	Reptiles				
Logs	Small mammals / reptiles				

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Threatened species
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No ✓ Yes / No ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No ✓	
Notes			

RE is a Core habiat for Acanthophis antarcticus, Furina dunmalli and Nyctophilus corbeni. Presence of habitat feature for these species.

General habitat for Hemiaspis damelii and Phascolarctos cinereus. H. damelii habitat feature was present like soil crack. No evidence of P. cinereus was using the area, but the presence of koala feed tree is abudant.

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	TWRP-T6	**Date:**	29 April 2024
Tenure:	PL194	**Assessor(s):**	Thiago Moura

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	285155
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7012962
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 1		#	
East	# 2		#	
South	# 3		#	
West	# 4		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain ✓
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%) ✓	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW ✓	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black ✓	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’ ✓	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent ✓	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry ✓	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth ✓	Logging	Thinning	No disturbance						
Dieback	0%	1-25% ✓	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate ✓	Poor	Degraded							
Fire scars	Absent ✓	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ✓	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2 ✓		S1		S2		G			
Avg height (m) of EDL	4				**Avg DBH (cm) of EDL**		17					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense) ✓		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse ✓		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site ✓
Weed infestations	Found on Site – records below ✓	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	NE		Start Easting	285134			End Easting	285180					
			Start Northing	7012978			End Northing	7012956					
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			9	15	2	9			1	2	0.1	1	
Canopy cover (%)			5		30				5		5		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra		6		6				
Acacia leiocalyx		33			27		16	
Angophora leiocarpa		4		4				
Corymbia clarksoniana		3		1	2			
Geijera parviflora		3			2		1	
Eucalyptus exserta		2			2			
Apphitonia excelsa		4			4			
Portulaca pilosa								
Solanum nemophilum								
Calotis cuneifolia								
Sida cordifolila								
Eragrostis elongata								
Hypochaeris albiflora								
Chrysocephalum apiculatum								
Cheilanthes sieberi								
Aristida caput-medisae								
Opuntia tomentosa								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	5	6	7	8	9	
Native perennial grass		10	30	70	50	
Native other grass (if relevant)						
Native forbs and other species (non-grass)		10			20	
Native shrubs (<1m)	10		10			
Non-native grass						
Non-native forbs and shrubs	10					
Litter	60	70	50	20	70	
Rock						
Bare ground	20	10	10	10	10	
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1	N/A	LC	NCAP
Survey result	11.5.1	N/A	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	Yes			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	**No. of hollow logs**	0	**Total length of logs (>10cm)**	0	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant ✓
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant ✓
Potential for **seeding grass cover**	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered ✓	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered ✓	Common	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common ✓	Abundant
Soil cracks	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	N/A	No. of trees with hollows (>30cm)	N/A

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Log	Small mammals / reptiles				

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes ✓	No	FSC is to be in attendance in all clearing operation
Ecologist	Yes	No ✓	
Species Management Plan	Yes ✓	No	Threatened Species
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ✓ ✓ Yes / No Yes / No ✓ ✓ Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No ✓	
Notes			

RE 11.5.1 is a Core habiat for Acanthophis antarcticus, Furina dunmalli and Nyctophilus corbeni. Presence of habitat feature for these species.

General habitat for Hemiaspis damelii and Phascolarctos cinereus. H. damelii habitat feature was not detected. No evidence of P. cinereus was using the area, but the presence of koala feed tree is common.

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero — zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	JP-03	**Date:**	22/5/24
Tenure:	PL 253 - Twelve Foot Park.	**Assessor(s):**	Josh Prosser

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	56J 0284748
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7011 2639
☐ Monitoring	☒ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	**Other description**	GDA 2020
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# ~~24~~	34	# ~~38~~	Staff
East	# ~~1~~	35	#	
South	# ~~1~~	36	#	
West	# ~~1~~	37	#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	Absent	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes	Regrowth . v							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	10					**Avg DBH (cm) of EDL**						
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
glandularia Asterigea.	low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	NW		Start Easting	56 J 0284760		End Easting	56 J 0284713					
			Start Northing	7012781		End Northing	7012853					
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)	6	10	6	10	4	6			0	2		
Canopy cover (%)	10		20		60				1.5			

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus Crebra				4				
Acacia leiocalyx					20			
Acacia conferta							5	
Gahnia aspera								
Callitris sp.								
Microlaena stipoides								
Dianella caerulea								
Sida Hackettiana								
Aristida sp.								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

targetzero
► zero incidents ► zero injuries

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	29	30	31	32	33	
Native perennial grass	5	30		60	35	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5		10	5	5	
Native shrubs (<1m)		30	5			
Non-native grass						
Non-native forbs and shrubs						
Litter	90	40	85	35	60	
Rock						
Bare ground						
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.4 regrowth	LC	NCAP	NCAP
Survey result	11.5.1 regrowth	LC	NCAP	NCAP
Agree with mapped RE? If no, provide justification from field data	Y			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	40	Total length of logs (>10cm)	60	No. of logs (>10cm)	32
Per hectare (x 20)	0	Per hectare (x 20)	60	Per hectare (x 20)	1200	Per hectare (x 20)	640

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for nectar / pollen	Absent	Scattered ✓	Common ✓	Abundant
Potential for fleshy fruiting plants	Absent	Scattered ✓	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common ✓	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered ✓	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered ✓	Common	Abundant
Large rocks (>30cm)	Absent	Scattered ✓	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered ✓	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers ✓	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered ✓	Common	Abundant
Rock piles	Absent	Scattered ✓	Common	Abundant
Trees with shedding bark	Absent	Scattered ✓	Common	Abundant
Soil cracks	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
logs / litter	general				

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	General Habitat
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Dense acacia regrowth.
T1/T2 acacia dominant
thick grassy layer w/ numerous logs & generalist habitat

North face of ESU

East face of ESU

South face of ESU

West face of ESU

targetzero
► zero incidents ► zero harm

SITE IDENTIFICATION			
Site Name:	WAR-KOG-RD-T1	Date:	24/6/24
Tenure:	PL493	Assessor(s):	DIC

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	281826
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7012148
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Gathering

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 81		#	
East	# 82		#	
South	# 83		#	
West	# 84		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	(Downs – open, rolling, ashy, pebbly)	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	(Grey)	(Pale)	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:					
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance					
Dieback	0%	1-25%	26-75%	>76%	n/a						
Site condition	Very good	Good	Moderate	Poor	Degraded						
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**				
Disturbance notes	Cleared for pasture. Thinned										

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G
Avg height (m) of EDL	17				**Avg DBH (cm) of EDL**				30		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	LOW	054			

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	N		Start Easting		281832		End Easting		281819				
			Start Northing		7012123		End Northing		7012171				
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			15	20					1	2	0.1	1	
Canopy cover (%)			10						5				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Aristida caput-medusae								
Eucalyptus populnea				2				
Acacia deanei								
Eremophila debilis								
Aristida calycina								
Dichanthium sericeum								
Eragrostis sp.								
Bothriochloa decipiens								
Dianella sp.								
Cymbopogon refractus								
Cheilanthes sp.								
Acacia leiocalyx								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	0085	86	87	88	89	
Native perennial grass	48	35	70	50	65	53.6
Native other grass (if relevant)	–					
Native forbs and other species (non-grass)	–	10				2
Native shrubs (<1m)	25	10				7
Non-native grass	–					
Non-native forbs and shrubs	–					
Litter	25	40	20	25	25	27
Rock	0					
Bare ground	2	5	10	25	10	10.4
Cryptogams	0					
Total	=100%	=100%	=100%	=100%	=100%	

Example 1 of 2

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	non-remn (cleared)	–	–	–
Survey result	11.5.1 (regrowth)			
Agree with mapped RE? If no, provide justification from field data	No. Vegetation is congruent with Thinneal Poplar Box dominant community.			

(for pasture)

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	Yes	No	
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / No		Is the vegetation suitable for slashing only?
	Yes / No		Is the slope < 5%?
	Yes / No		Is the clay content > 20%?
	Yes / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	No	
Notes			

Poplar box community thinned for pasture. Mature trees meet height threshold but the canopy cover is not high enough.

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-0006?

targetzero

SITE IDENTIFICATION			
Site Name:	KOG-RD-T2	Date:	24/6/24
Tenure:	PL493	Assessor(s):	DK

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	281750
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7012271
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

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Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 90		#	
East	# 91		#	
South	# 92		#	
West	# 93		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)		Moderately sloping (5-10%)		Strongly sloping (11-24%)		
	Moderately steep (25-38%)	Steep (39-55%)		Very steep (56-100%)		Slope >100% (45°)		
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange		Brown		Red		
	Black	Grey	Pale		Dark		Mottled		
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		Absent		Scattered		Frequent		
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%		26-75%	>76%		n/a	
Site condition	Very good	Good		Moderate	Poor		Degraded	
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes	Cleared for pasture.							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	0-5					**Avg DBH (cm) of EDL**			0			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	N	Start Easting	281768	End Easting	281732							
		Start Northing	7012254	End Northing	7012289							
Stratum	E	T1		T2		T3		S1		S2/Seedlings		
Height range (m)										0.1	0.5	
Canopy cover (%)												

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Aristida caput-medusae								
Chloris ventricosa								
Bothriochloa decipiens								
Sporobolus caroli								
Cheilanthes sp.								
Glandularia aristigera								
Chloris virgata								
Maireana microphylla								
Enteropogon sp.								
Fimbristylis dichotoma								
Eragrostis sp.								
Eragrostis sp. 2								
Acacia deanei								
Eragrostis lacunaria								
Portulaca pilosa								
Calotis lappulacea								
Solanum sp.								
Panicum effusum								
Melinis repens								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	91 →					
Native perennial grass	70	50	50	55	73	59.6
Native other grass (if relevant)						
Native forbs and other species (non-grass)			5	5	2	2.4
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	20	20	15	10	20	17
Rock						
Bare ground	10	30	30	30	5	21
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	non-rem	—	—	—
Survey result	non-rem (cleared)			
Agree with mapped RE? If no, provide justification from field data	Yes. Cleared for pasture.			

Derived Grassland

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species	
V	Vulnerable		
NT	Near Threatened		
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds	
CBS	Colonial Breeding Species		

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	Yes	No	
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / No		Is the vegetation suitable for slashing only?
	Yes / No		Is the slope < 5%?
	Yes / No		Is the clay content > 20%?
	Yes / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	No	
Notes			

Grass has browned off for winter.

North face of transect

East face of the transect

South face of the transect

West face of the transect

targetzero
► zero incidents ► zero harm

SITE IDENTIFICATION			
Site Name:	KOG-RD-T3	**Date:**	24/6/24
Tenure:	PL493	**Assessor(s):**	DK

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	0284104
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7012307
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 99		#	
East	# 100		#	
South	# 101		#	
West	# 102		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	(Nil)
Soil Colour	White	Yellow	Orange	Brown	Red			
	Black	Grey	(Pale)	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	(Loamy sand)	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: Gas industry						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars X	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Recently cleared for Gas well (?)											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	0.5					**Avg DBH (cm) of EDL**			—			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	N	Start Easting	284114	End Easting	284094							
		Start Northing	7012286	End Northing	7012330							
Stratum	E	T1		T2		T3		S1		S2/Seedlings		
Height range (m)								1	2	0.1	0.5	
Canopy cover (%)												

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Cheilanthes sp.								
Eragrostis sp.								
Sida rhombifolia								
Gonocarpus urceolatus								
Fimbristylis dichotoma								
Aristida calycina								
Eragrostis lacunaria								
Aristida caput-medusae								
Eriachne mucronata								
Glandularia aristigera								
Dysphania sp.								
Chrysopogon fallax								
Solanum sp.								
Digitaria brownii								
Acacia leiocalyx								
Eucalyptus crebra								
Schkuhria pinnata								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	103	104	105	106	107	
Native perennial grass	70	55	10	75	55	53
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	10	5	20	15	12
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs			10			2
Litter	10	10		5		5
Rock						
Bare ground	10	25	75		30	28
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.7	—	LC	NCAP
Survey result	non-rem (cleared)		—	—
Agree with mapped RE? If no, provide justification from field data	No. An area previously/recently cleared. Where well pad is located.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	25	No. of logs (>10cm)	4
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	50	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

Bradychiton

R Digitaria brownii

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	Yes	No	
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / No		Is the vegetation suitable for slashing only? Some trees/shrubs
	Yes / No		Is the slope < 5%?
	Yes / No		Is the clay content > 20%?
	Yes / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	No	
Notes			

~~Road~~ Recently cleared.

Some shrubby vegetation present outside transect.

North face of transect

East face of the transect

South face of the transect

West face of the transect

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	KOG-RD-T4	**Date:**	24/6/24
Tenure:	PL493	**Assessor(s):**	DK

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	284239
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7012666
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	access track.
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 112		#	
East	# 113		#	
South	# 114		#	
West	# 115		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	(Nil)
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	(Loamy sand)	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

targetzero
► zero rodents ► zero range

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: leisure				
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance				
Dieback	0%	1-25%	26-75%	>76%	n/a					
Site condition	Very good	Good	Moderate	Poor	Degraded					
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**			
Disturbance notes	some thin tracks pushed throug veg intermittently									

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	16		**Avg DBH (cm) of EDL**	25	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Ozothamnus stricta	Low				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	N	Start Easting		284251		End Easting		284227					
		Start Northing		7012647		End Northing		7012689					
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)			14	18	8	14			2	6	0.1	2	
Canopy cover (%)		30		10				10					

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus fibrosa				11	3			
Eucalyptus exserta				1				
Callitris glaucophylla				21	3			
Acacia leiocalyx							3	13
Acacia conferta								11
Lepidosperma laterale								
Acacia conferta								
Acacia leiocalyx								
Callitris glaucophylla								
Alphitonia excelsa								
Psydrax odorata								
Aristida caput-medusae								
Eragrostis sp.								
Cyanthillium cinereum								
Entolasia stricta								
Dianella caerulea								
Diplachne fusca								
Opuntia stricta								
Opuntia tomentosa								
Solanum nemophilum								
Cheilanthes sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						
Panicum effusum								
Lomandra sp.								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	116.	117	118	119	120	
Native perennial grass	70	46	25	30	25	38
Native other grass (if relevant)						
Native forbs and other species (non-grass)		5	5	5		3
Native shrubs (<1m)	15					3
Non-native grass						
Non-native forbs and shrubs						
Litter	15	40	60	55	63	46.6
Rock						
Bare ground		15	10	10	10	9
Cryptogams					2	0.4
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.7.7	—	LC	NCAP
Survey result	11.7.7	—	LC	NCAP
Agree with mapped RE? If **no**, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	2	**No. of hollow logs**	0	**Total length of logs (>10cm)**	21	**No. of logs (>10cm)**	0
Per hectare (x 20)	0	**Per hectare (x 20)**	0	**Per hectare (x 20)**	420	**Per hectare (x 20)**	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	0	No. of trees with hollows (>30cm)	0

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation to be cleared
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Eucalyptus fibrosa dominant woodland

North face of transect

East face of the transect

South face of the transect

West face of the transect

targetzero
► zero incidents ► zero harm

SITE IDENTIFICATION			
Site Name:	COND-RIVER-T1	**Date:**	25/6/24
Tenure:	PL493	**Assessor(s):**	DK

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	0283493
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7018556
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	~~Gas~~ River crossing
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 122		#	
East	# 123		#	
South	# 124		#	
West	# 125		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:				
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance				
Dieback	0%	1-25%	26-75%	>76%	n/a					
Site condition	Very good	Good	Moderate	Poor	Degraded					
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**			
Disturbance notes	Weedy ground cover grasses & forbs.									

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1			T2		S1		S2		G	
Avg height (m) of EDL	~~18~~				**Avg DBH (cm) of EDL**	40					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a		
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent		

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	E	Start Easting		283470		End Easting		283514					
		Start Northing		7018543		End Northing		7018557					
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)			15	19	10	15			2	8	0.1	2	
Canopy cover (%)		30		15				5					

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus coolabah				7				
Acacia salicina							3	2
Alectryon oleifolius							3	
Sonchus sp.								
Tetragonia tetragonoides								
Panicum coloratum								
Alternanthera denticulata								
Eustrephus latifolius								
Xanthium occidentale								
Physalis angulata								
Rapistrum rugosum								
Erigeron sp.								
Malvastrum coromandelianum								
Phyla canescens								
Glandularia aristigera								
Cyperus sp.								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	126	→			→	
Native perennial grass						
Native other grass (if relevant)						
Native forbs and other species (non-grass)		5	2		20	
Native shrubs (<1m)						
Non-native grass	2			50		
Non-native forbs and shrubs	8					
Litter	10	15	23	40	40	
Rock						
Bare ground	80	80	75	10	40	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE State Map	11.3.25/11.3.2/11.3.4			
Survey result	11.3.25	–	OC	OC
Agree with mapped RE? If no, provide justification from field data	Yes However, purely 11.3.25 at this location.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	4	No. of hollow logs	4	Total length of logs (>10cm)	33	No. of logs (>10cm)	9
Per hectare (x 20)	80	Per hectare (x 20)	80	Per hectare (x 20)	660	Per hectare (x 20)	180

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Vegetation to be cleared
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment:	Yes	(No)	Is the vegetation suitable for slashing only?
	Yes	(No)	Is the slope < 5%?
Suitable – if all 4 questions are yes	Yes	(No)	Is the clay content > 20%?
	(Yes)	No	Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Large, mature trees with well developed hollows in broadern ity

Clay soils present along Condamine River and ample woody debris.
This area should be considered Grey Snake habitat.

North face of transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	COND - T2	**Date:**	25/6/24
Tenure:	PL493	**Assessor(s):**	DK

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	0283404
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7018400
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 131		#	
East	# 132		#	
South	# 133		#	
West	# 134		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%		26-75%	>76%	n/a	
Site condition	Very good	Good		Moderate	Poor	Degraded	
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**
Disturbance notes	Previously cleared – Younger trees, low dbh						

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	13					**Avg DBH (cm) of EDL**			25			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	S	Start Easting	283416			End Easting	283390						
		Start Northing	7018418			End Northing	7018379						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			11	14					2	6	0.1	2	
Canopy cover (%)			5						2				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus populnea				4				
Panicum coloratum								
Phyla canescens								
Glandularia aristigera								
Physalis angulata								
Medicago polymorpha								
Erigeron sp.								
Malvastrum coromandelianum								
Cenchrus ciliaris								
Rumex brownii								
Eleocharis sp.								
Sclerolaena muricata								
Brachyscome sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	135 →				→	
Native perennial grass						
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass	60	65	20	20	30	
Non-native forbs and shrubs	15		10	5	30	
Litter	25	30	70	90	40	
Rock						
Bare ground		5				
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	non-rem	—	—	—
Survey result	11.3.2 (regrowth)			
Agree with mapped RE? If no, provide justification from field data	No. Apparent regrowth with considerable die-back.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Severe die-back of both Pop Box & Coolibah.

North face of transect

East face of the transect

South face of the transect

West face of the transect

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	COND-T3	Date:	25/6/24
Tenure:	PL493	Assessor(s):	DK

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	0283103
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7017775
☐ Monitoring	☒ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 144		#	
East	# 145		#	
South	# 146		#	
West	# 147		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	NW	SE	SW	(Nil)
Soil Colour	White	Yellow	Orange	(Brown)	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	(Sandy clay loam')	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	(Absent)	Scattered	Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank						

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Cleared for pasture. Weed species dominant											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1		S2			G	
Avg height (m) of EDL	→			0.5		**Avg DBH (cm) of EDL**		—				
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)			n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse		Very sparse			Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	Low				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	E	Start Easting	283081	End Easting	283129							
		Start Northing	7017783	End Northing	7017760							
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)											0.1	1
Canopy cover (%)												

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Rapistrum rugosum								
Medicago polymorpha								
Glandularia aristigera								
Brachyscome sp.								
Enchylaena tomentosa								
Malvastrum coromandelianum								
Sclerolaena tetracuspis								
sclerolaena muricata								
Bothriochloa bladhii								
Senna barclayana								
Opuntia tomentosa								
Chloris ventricosa								
Rhagodia spinescens								
Lepidium sp.								
Dichanthium sericeum								
Alternanthera denticulata								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	148 →				→	
Native perennial grass	10	5	10	5	5	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)	10	40				
Non-native grass						
Non-native forbs and shrubs	60	25	75	85	80	
Litter	20	28	15	10	15	
Rock						
Bare ground		2				
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	non-rem	—	—	—
Survey result	non-rem (cleared)	—	—	—
Agree with mapped RE? If no, provide justification from field data	YES.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Potential for Grey Snake.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	No	
Notes			

Weedy grassland/pasture.

Potential Grey Snake habitat.

North face of transect

East face of the transect

South face of the transect

West face of the transect

targetzero

SITE IDENTIFICATION			
Site Name:	COND - T4	**Date:**	25/6/24
Tenure:	PL493	**Assessor(s):**	DK

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	0285568
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7017400
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 157		#	
East	# 158		#	
South	# 159		#	
West	# 160		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	(Slope or hill not specified)	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	(W)	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	('Sandy loam')	**'Loam'**	**'Silty loam'**		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

targetzero
► zero incidents ► zero injuries

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance cattle observed						
Dieback	0%	(1-25%)	26-75%	>76%	n/a							
Site condition	Very good	Good	(Moderate)	Poor	Degraded							
Fire scars	Absent	(Scattered)	Frequent	**Time since**	Recent	(Old)	**Average Height (m)**	2m				
Disturbance notes	Cleared area & potentially from hot fire											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**(WDL)**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2		S1			S2			G
Avg height (m) of EDL	18					**Avg DBH (cm) of EDL**			30			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse			Absent

check Pentya.

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia stricta	LOW	079			

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	S	Start Easting	283554			End Easting	283585						
		Start Northing	7017417			End Northing	7017378						
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)			16	20	10	15			2	8	0.1	2	
Canopy cover (%)		30		5				5					

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra				4				
Carissa ovata								2
Allocasuarina sp.							1	
Olearia canescens								2
Olearia elliptica								5
Hovea sp.								2
Indigofera sp.								1
Solanum parvifolium								
Ancistrachne uncinulata								
Paspalidium sp.								
Nyssanthes sp.								
Panicum coloratum								
Pittosporum angustifolium								
Austrostipa sp.								
Einadia hastata								
Digitaria sp.								
Cyanthillium cinereum								
Acacia leiocalyx								
Elaeodendron australe								
Aristida caput-medusae								
Teucrium junceum								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						
Entolasia sp.								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	161				17	
Native perennial grass	40	60	40	70	70	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	40					
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs		10				
Litter	20	30	50	30	20	
Rock						
Bare ground			10		10	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	-	LC	NCAP
Survey result	11.7.7	-	LC	NCAP
Agree with mapped RE? If no, provide justification from field data	No. This RE, at this location, is not mixed Eucalypt woodland.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	10	No. of logs (>10cm)	2
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	200	Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	0	No. of trees with hollows (>30cm)	0

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	Yes / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Not a mixed Eucalypt woodland.

E. crebra dominant.

North face of transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	COND-TS	Date:	25/6/24
Tenure:	PL493	Assessor(s):	VK

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	0283339
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7017490
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 166		#	
East	# 167		#	
South	# 168		#	
West	# 169		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)		Moderately sloping (5-10%)		Strongly sloping (11-24%)		
	Moderately steep (25-38%)	Steep (39-55%)		Very steep (56-100%)		Slope >100% (45°)		
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White		Yellow		Orange	Brown		Red	
	Black		Grey		Pale	Dark		Mottled	
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent			Scattered		Frequent		
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	(cattle observ.	
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G
Avg height (m) of EDL	17					**Avg DBH (cm) of EDL**			25		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia stricta	LOW	083			

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing			Start Easting		283350		End Easting		283318				
			Start Northing		7017468		End Northing		7017507				
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			15	20	8	15			2	8	0.1	2	
Canopy cover (%)			20		10				5		20		

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus woollsiana				3	4			
Acacia harpophylla					2			
Allocasuarina sp.					5			
Carissa ovata								15
Alectryon diversifolius							1	
Alphitonia excelsa								1
Notelaea microcarpa								1
Rhagodia spinescens								2
Hovea sp.								2
Jasminum didymum								
Chloris ventricosa								
Einadia hastata								
Aristida sp.								
Diplachne fusca								
Hibiscus sturtii								
Capparis sp.								
Capparis anomala								
Notelaea microcarpa								
Abutilon oxycarpum								
Capparis lasiantha								
Malvastrum coromandelianum								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						
Tetragonia tetragonoides								
Setaria sp.								
Opuntia tomentosa								
Eremophila debilis								
Enchylaena tomentosa								
Solanum parvifolium								
Cenchrus ciliaris								
Capparis loranthifolia								
Cyanthillium cinereum								
Calotis cuneifolia								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	470 →				→	
Native perennial grass	40	50	50	30	40	
Native other grass (if relevant)						
Native forbs and other species (non-grass)				10		
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs		20	20		10	
Litter	20	30	20	50	40	
Rock						
Bare ground	40		10	10	10	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4		LC	NCAP
Survey result	11.5.20		LC	NCAP
Agree with mapped RE? If no, provide justification from field data	No. E. woollsiana dominant. Not highly weathered soils. E. woollsiana not in 11.7.4 mixed Euc RE.			

7+/0+10+3+6

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	3	Total length of logs (>10cm)	36	No. of logs (>10cm)	6
Per hectare (x 20)	0	Per hectare (x 20)	60	Per hectare (x 20)	720	Per hectare (x 20)	120

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	0	No. of trees with hollows (>30cm)	0

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)
N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species	
V	Vulnerable		
NT	Near Threatened		
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds	
CBS	Colonial Breeding Species		

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	Yes	No	
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / No		Is the vegetation suitable for slashing only?
	Yes / No		Is the slope < 5%?
	Yes / No		Is the clay content > 20%?
	Yes / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	No	
Notes			

E. woollsiana dominant E. woollsiana not described in 11.7.4 RE.

Soils not heavily weathered

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero waste

SITE IDENTIFICATION			
Site Name:	COND - T6	**Date:**	25/6/24
Tenure:	PL493	**Assessor(s):**	DK

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0283099
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7017280
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 181		#	
East	# 182		#	
South	# 183		#	
West	# 184		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	(N)	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

targetzero

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	Cattle present					
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2			S1			S2		G
Avg height (m) of EDL	12						**Avg DBH (cm) of EDL**			20		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia stricta	LOW				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	E	Start Easting	283080			End Easting	283121						
		Start Northing	7017282			End Northing	7017272						
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)			10	13	4	10			2	4	0.1	2	
Canopy cover (%)		30		20				5					

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia harpophylla				31	12			1
Acacia sp.							1	
Alectryon diversifolius								1
Eremophila mitchellii								1
Rhagodia spinescens								1
Capparis loranthifolia								
Carissa ovata								
Ancistrachne uncinulata								
Einadia nutans								
Brunoniella australis								
Solanum sp.								
Sigesbeckia orientalis								
Tetragonia tetragonoides								
Chloris ventricosa								
Enchylaena tomentosa								
Digitaria sp.								
Sclerolaena sp.								
Setaria sp.								
Chenopodium sp.								
Marsdenia sp.								
Opuntia stricta								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						
Capparis sp.								
Opuntia tomentosa								
Enteropogon sp.								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	185	→	→	→	→	
Native perennial grass	75	15	50	40	65	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10				10	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	15	60	40	40	20	
Rock						
Bare ground		25	10	20	5	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	~~11~~ 11.9.5	Endangered	Endangered	Endangered
Survey result	11.3.1	"	"	"
Agree with mapped RE? If no, provide justification from field data	~~Yes~~ No. Community is situated on Alluvial surface geology. Not conducive to fine grained sedimentary geology. 15+3+5 = 23			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	2	No. of hollow logs	1	Total length of logs (>10cm)	23	No. of logs (>10cm)	7
Per hectare (x 20)	0	Per hectare (x 20)	20	Per hectare (x 20)	460	Per hectare (x 20)	140

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for nectar / pollen	Absent	Scattered	(Common)	Abundant
Potential for fleshy fruiting plants	Absent	(Scattered)	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	(Common)	Abundant
Dense shrub/grass shelter	Absent	(Scattered)	Common	Abundant
Large Eucalypts (>30cm DBH)	(Absent)	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	(Scattered)	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	(Scattered)	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	(Scattered)	Common	Abundant
Termite mounds (>50cm)	(Absent)	Scattered	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	(Absent)	Scattered	Common	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	(Absent)	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	(Scattered)	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment:	Yes / No		Is the vegetation suitable for slashing only?
	Yes / No		Is the slope < 5%?
Suitable – if all 4 questions are yes	Yes / No		Is the clay content > 20%?
	Yes / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

See RE mapping section.

North face of transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	COND - 17	Date:	25/6/24
Tenure:	PL493	Assessor(s):	DIC

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	0282945
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7017038
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 194		#	
East	# 195		#	
South	# 196		#	
West	# 197		#	

L27

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)		Moderately sloping (5-10%)		Strongly sloping (11-24%)		
	Moderately steep (25-38%)	Steep (39-55%)		Very steep (56-100%)		Slope >100% (45°)		
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White		Yellow		Orange	Brown		Red	
	Black		Grey		Pale	Dark		Mottled	
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion	Absent			Scattered		Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

targetzero

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:					
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance					
Dieback	0%	1-25%	26-75%	>76%	n/a						
Site condition	Very good	Good	Moderate	Poor	Degraded						
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**				
Disturbance notes	Some large gaps in canopy → fire or shallow scarp/soil? Shrubby Acacia regrowth.										

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G		
Avg height (m) of EDL	16				**Avg DBH (cm) of EDL**		25				
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a		
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent		

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia	LOW				
Tiger Pear	LOW	094			

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	W	Start Easting	282960			End Easting	282926						
		Start Northing	7017024			End Northing	7017057						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			15	19	8	15			2	8	0.1	2	
Canopy cover (%)			25		10				15				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra				5	2			
Acacia leiocalyx					1		1	8
Parsonsia eucalyptophylla					1			
Amyema sp.				1				
Acacia conferta								1
Alstonia constricta								1
Acacia deanei							1	
Maireana microphylla								1
Olearia elliptica								1
Opuntia aurantiaca								
Solanum parvifolium								3
Carissa ovata								2
Entolasia stricta								
Opuntia tomentosa								
Hibiscus sturtii								
Sida corrugata								
Abutilon oxycarpum								
Einadia hastata								
Ancistrachne uncinulata								
Aristida sp.								
Digitaria sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						
Diplachne fusca								
Parsonsia sp. 1								
Aristida caput-medusae								
Nyssanthes sp.								
Cyanthillium cinereum								
Setaria sp.								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	178 →				→	
Native perennial grass	65	55	50	60	30	52
Native other grass (if relevant)						
Native forbs and other species (non-grass)		5	5		10	4
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	30	40	35	20	30	31
Rock						
Bare ground	5	[illegible]	10	20	30	13
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	—	LC	NCAP
Survey result	11.7.7	—	"	"
Agree with mapped RE? If no, provide justification from field data	No. Not a mixed Eucalypt woodland community.			

4+1+0+5 3+1

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	1	No. of hollow logs	0	Total length of logs (>10cm)	19	No. of logs (>10cm)	4
Per hectare (x 20)	20	Per hectare (x 20)	0	Per hectare (x 20)	380	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	0	No. of trees with hollows (>30cm)	/

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment:	Yes / (No)		Is the vegetation suitable for slashing only?
Suitable – if all 4 questions are yes	Yes / (No)		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

E. crebra dominant woodland.

North face of transect

East face of the transect

South face of the transect

West face of the transect

targetzero

SITE IDENTIFICATION			
Site Name:	COND-T8	**Date:**	25/6/24
Tenure:	PL493	**Assessor(s):**	DK

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	0284664
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7015351
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 203		#	
East	# 204		#	
South	# 205		#	
West	# 206		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	(Downs – open, rolling, ashy, pebbly)	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (*field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content*)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:					
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance					
Dieback	0%	1-25%		26-75%	>76%		n/a				
Site condition	Very good	Good		Moderate	Poor		Degraded				
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**				
Disturbance notes	Cleared + Pasture improved										

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G
Avg height (m) of EDL	5					**Avg DBH (cm) of EDL**			10		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	S	Start Easting	284658			End Easting	284666						
		Start Northing	7015376			End Northing	7015327						
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)			4	8					1	2	0.1	1	
Canopy cover (%)		5				2							

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia harpophylla				6			1	
Senecio sp. (native)								
Chloris inflata								
Panicum coloratum								
Glandularia aristigera								
Cyclospermum leptophyllum								
Malvastrum coromandelianum								
Senecio sp. 2 (native)								
Cyperus gracilis								
Xanthium occidentale								
Phyla canescens								
Maireana microphylla								
Brachyscome sp.								
Cyperus eragrostis								
Calotis lappulacea								
Eleocharis sp.								
Physalis angulata								
Schkuhria pinnata								
Rumex sp.								
Cenchrus ciliaris								
Erigeron sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						
Portulaca pilosa								
Alternanthera sp.								
Gomphrena celosioides								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	207 →					
Native perennial grass						
Native other grass (if relevant)						
Native forbs and other species (non-grass)		10	5			
Native shrubs (<1m)						
Non-native grass	20	10	40	63	10	
Non-native forbs and shrubs	10		~~5~~ 10	2		
Litter	70	80	45	30	90	
Rock						
Bare ground				5		
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (OUT →)	non-veg	–	–	–
Survey result	11.4.3 (regrowth)			
Agree with mapped RE? If no, provide justification from field data	Does not meet exotic ground cover threshold for TEC.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	1	Total length of logs (>10cm)	7	No. of logs (>10cm)	3
Per hectare (x 20)	0	Per hectare (x 20)	20	Per hectare (x 20)	140	Per hectare (x 20)	60

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	Yes / (No)		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

clay soil, soil crank, scattered shrubby brigalow

Weeds dominant in ground layer.

Does not meet TEC thresholds

North face of transect

East face of the transect

South face of the transect

West face of the transect

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	PAST-PROP-T1	**Date:**	26/6/24
Tenure:	PL493	**Assessor(s):**	DK

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	0283103
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7016642
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 224		#	
East	# 225		#	
South	# 226		#	
West	# 227		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ~~ESU or~~ 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	(N)	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	(Pale)	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

targetzero

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	Cattle observed					
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	7		**Avg DBH (cm) of EDL**	8	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	S		Start Easting		283116		End Easting		283086			
			Start Northing		7016661		End Northing		7016623			
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)	10	15	4	7					1	4	0.1	1
Canopy cover (%)	2		35						10			

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia leiocalyx				46				
Eucalyptus crebra			1					
Eucalyptus exserta			1					
Seringia corollata								1
Ancistrachne uncinulata								
Dianella caerulea								
Lepidosperma laterale								
Digitaria sp.								
Cyanthillium cinereum								
Setaria sp.								
Brachyscome sp.								
Parsonsia eucalyptophylla								1
Solanum sp.								
Oxalis sp.								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	228 →				→	
Native perennial grass	20	10	40	20	20	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	30		15			
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	35	80	40	70	40	
Rock						
Bare ground	15	10	5	10	40	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4 (remnant)		LC	NCAP.
Survey result	11.7.4 (regrowth)		LC	NCAP.
Agree with mapped RE? If no, provide justification from field data	No. This area does not meet height threshold for remnant.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	63.5	No. of logs (>10cm)	11
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	1,270	Per hectare (x 20)	220

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for nectar / pollen	Absent	Scattered	(Common)	Abundant
Potential for fleshy fruiting plants	(Absent)	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	(Common)	Abundant
Dense shrub/grass shelter	Absent	(Scattered)	Common	Abundant
Large Eucalypts (>30cm DBH)	(Absent)	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	(Absent)	Scattered	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	(Absent)	Scattered	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	(Scattered)	Common	Abundant
Termite mounds (>50cm)	(Absent)	Scattered	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	(Absent)	Scattered	Common	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	(Scattered)	Common	Abundant
Mistletoe/Epiphytes	(Absent)	Scattered	Common	Abundant

5.5+1+4+1+5+6+10+10+6+9+6 = total log length

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	0	No. of trees with hollows (>30cm)	0

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	Yes	No	
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment:	Yes / No		Is the vegetation suitable for slashing only?
	Yes / No		Is the slope < 5%?
Suitable – if all 4 questions are yes	Yes / No		Is the clay content > 20%?
	Yes / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	No	
Notes			

Mixed Eucalypt woodland with dense layer of Acacia leiocalyx.

North face of transect

East face of the transect

South face of the transect

West face of the transect

targetzero

SITE IDENTIFICATION			
Site Name:	PAST - PROP - T2	**Date:**	26/6/24
Tenure:	PL493	**Assessor(s):**	DK

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0283312
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7016036
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 245		#	
East	# 246		#	
South	# 247		#	
West	# 248		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: Gas industry		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	Cattle obs.	
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes	Dense Streak.							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G
Avg height (m) of EDL	9					**Avg DBH (cm) of EDL**			15		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Tiger pear.	LOW	105			

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	NW		Start Easting		283331		End Easting		283285			
			Start Northing		7016031		End Northing		7016037			
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)	14	16	7	11					2	7	0.1	2
Canopy cover (%)	5		40						10			

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina luehmannii				51			18	
Eucalyptus crebra			2	1				
Acacia conferta							2	
Eucalyptus tereticornis			1					
Aristida sp.								
Cheilanthes sp.								
Sporobolus disjunctus								
Aristida caput-medusae								
Alternanthera nana								
Eragrostis sp.								
Chloris ventricosa								
Cyperus sp.								
Lomandra ramosissima								
Nyssanthes sp.								
Thellungia advena								
Enteropogon unispiceus								
Lysiana sp.								
Fimbristylis dichotoma								
Dianella caerulea								
Poaceae sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	249 →				→	
Native perennial grass	10			25		
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5	5	~~3~~ 25	5	4	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs				2		
Litter	~~70~~85	85	75	68	93	
Rock						
Bare ground		10			3	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	—	LC	NCAP
Survey result	11.7.7 Regrowth	—	"	"
Agree with mapped RE? If no, provide justification from field data	No. A. leichhardtii dominant canopy with sparse Euc's Likely impacted by clearing.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	2	Total length of logs (>10cm)	9.5	No. of logs (>10cm)	3
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	190	Per hectare (x 20)	~~6~~60

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for nectar / pollen	Absent	Scattered	(Common)	Abundant
Potential for fleshy fruiting plants	Absent	(Scattered)	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	(Common)	Abundant
Dense shrub/grass shelter	(Absent)	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	(Absent)	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	(Scattered)	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	(Absent)	Scattered	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	(Common)	Abundant
Termite mounds (>50cm)	(Absent)	Scattered	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	(Absent)	Scattered	Common	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	(Scattered)	Common	Abundant
Mistletoe/Epiphytes	Absent	(Scattered)	Common	Abundant

3+.5+1.5

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	0	No. of trees with hollows (>30cm)	0

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment:	Yes / (No)		Is the vegetation suitable for slashing only?
Suitable – if all 4 questions are yes	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Dense layer of A. luehmannii.

Regrowth.

North face of transect

East face of the transect

South face of the transect

West face of the transect

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	PAST-PROP-T3	**Date:**	26/6/24
Tenure:	PL493	**Assessor(s):**	DK

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0283905
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7016104
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 262		#	
East	# 263		#	
South	# 264		#	
West	# 265		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	(Level (<1%))	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	(Nil)
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	(Pale)	Dark	Mottled			
Soil (field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	(Loamy sand)	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

targetzero

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: Gas industry						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Some logging evident from chainsaw cross-cuts.											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1		S2			G	
Avg height (m) of EDL	~17					**Avg DBH (cm) of EDL**		35				
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	S	Start Easting		283879		End Easting		283928					
		Start Northing		7016109		End Northing		7016099					
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			15	19	8	15			2	8	0.1	2	
Canopy cover (%)			25		10				30				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra				5	1		1	1
Geijera parviflora							1	1
Notelaea microcarpa							12	2
Carissa ovata								17
Capparis arborea							1	
Alphitonia excelsa							1	
Casuarina cristata					4		2	
Hakea lorea							3	
Hovea sp.							2	
Pittosporum angustifolium							1	1
Psydrax odorata							1	
Indigofera australis								3
Acacia conferta								1
Aristida sp.								
Seringia corollata								
Poaceae sp.								
Nyssanthes sp.								
Panicum coloratum								
Ancistrachne uncinulata								
Aristida caput-medusae								
Sporobolus sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						
Teucrium junceum								
Sida hackettiana								
Asteraceae sp.								
Opuntia tomentosa								
Hibiscus sturtii								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	266 →				→	
Native perennial grass	50	48	20	5	10	26.6
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5	2				1.4
Native shrubs (<1m)		10		75	70	31
Non-native grass						
Non-native forbs and shrubs						
Litter	45	35	20	20	20	28
Rock						
Bare ground		5	60			13
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.4	—	LC	NCAP
Survey result	11.7.7	—	〃	〃
Agree with mapped RE? If no, provide justification from field data	No. not mixed Eucalypt community.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	3	No. of hollow logs	0	Total length of logs (>10cm)	1.5	No. of logs (>10cm)	1
Per hectare (x 20)	60	Per hectare (x 20)	0	Per hectare (x 20)	30	Per hectare (x 20)	20

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for nectar / pollen	Absent	Scattered	(Common)	Abundant
Potential for fleshy fruiting plants	Absent	(Scattered)	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	(Common)	Abundant
Dense shrub/grass shelter	Absent	Scattered	(Common)	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	(Common)	Abundant
Large Non-Eucalypts (>20cm DBH)	(Absent)	Scattered	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	(Absent)	(Scattered)	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	(Scattered)	Common	Abundant
Termite mounds (>50cm)	(Absent)	Scattered	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	Absent	(Scattered)	Common	Abundant
Soil cracks	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	(Common)	Abundant
Mistletoe/Epiphytes	Absent	(Scattered)	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	0	No. of trees with hollows (>30cm)	1

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

E. crebra alommain woodland.

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	PAST-PROP-T4	**Date:**	26/06/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0283974
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7016631
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☐ Roads & Tracks	☐ Seismic Line	**Other description**	CAT B within 300m
☐ Work over	☒ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#283		#	
East	#284		#	
South	#285		#	
West	#286		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain☑
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)☑	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E☑	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’☑	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent	Scattered☑	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully☑	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate☑	Poor	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Disturbed by cattle grazing											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑	T2	S1	S2	G							
Avg height (m) of EDL	14	**Avg DBH (cm) of EDL**	30									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse) ☑	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below	Not Found On Site☑

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	E	Start Easting	283950			End Easting	283999						
		Start Northing	7016634			End Northing	7016627						
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)			12	15	6	11			2	6	0.1	2	
Canopy cover (%)		30		20				5					

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia harpophylla				6	5		10	5
Casuarina cristata				1	1			
Geijera parviflora								
Carissa ovata								1
Rhagodia spinescens								1
Amyema quandang							1	
Nyssanthes sp.								
Sclerolaena sp.								
Vittadinia sp.								
Enchylaena tomentosa								
Sclerolaena muricata								
Setaria sp.								
Abutilon oxycarpum								
Einadia nutans								
Cheilanthes sp.								
Chloris ventricosa								
Tetragonia tetragonoides								
Hibiscus sturtii								
Opuntia tomentosa								
Chenopodium sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	287	288	289	290	291	
Native perennial grass		15	40	20	3	15.6
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	15				5
Native shrubs (<1m)					2	0.4
Non-native grass						
Non-native forbs and shrubs						
Litter	60	50	60	30	25	45
Rock	15			5		4
Bare ground	15	20		45	70	30
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.4.3/11.5.20	Endangered	Endangered	Endangered
Survey result	11.4.3 Regrowth	Endangered	Endangered	Endangered
Agree with mapped RE? If **no**, provide justification from field data				

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**6**	**No. of logs (>10cm)**	**2**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**120**	**Per hectare (x 20)**	**40**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered☑	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered☑	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered☑	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent☑	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common☑	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered☑	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered☑	Common	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent☑	Scattered	Common	Abundant
Soil cracks	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent☑	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered☑	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	**X**	**No. of trees with hollows (>30cm)**	**X**

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: **Animal tracks** **Feed scars** **Scratches** **Diggings** **Scats** **Casts** **Bones** **Feathers** **Other**

Breeding places: **Nests** **Burrows** **Shelters** **Drays** **Bowers** **Other**

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes / No☑ Yes☑ / No Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

Large mature Brigalow present, but does not meet the minimum canopy cover requirements for remnant. This site was higher up the slope on texture contrast soils, therefore the canopy height was lower than the benchmark.

Grey Snake habitat absent.

North face of transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-[illegible]

targetzero

SITE IDENTIFICATION			
Site Name:	VAST-PROD-5	**Date:**	26/6/24
Tenure:	PL493	**Assessor(s):**	DK.

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	0284344
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7016377
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 303		#	
East	# 304		#	
South	# 305		#	
West	# 306		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	(Slope or hill not specified)	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	(Orange)	(Brown)	Red				
	Black	Grey	(Pale)	Dark	Mottled				
Soil (*field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content*)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**		
	'Sandy clay loam'	**('Clay loam')**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

targetzero
► zero rodents ► zero navel

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	Time since	Recent	Old	Average Height (m)					
Disturbance notes	Pasture improved											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2					
Avg height (m) of EDL	5			**Avg DBH (cm) of EDL**								
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Tiger Pear					
Opuntia stricta	LOW	118			
Opuntia tomentosa	LOW	119			

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	W	Start Easting	284362	End Easting	284326							
		Start Northing	7016395	End Northing	7016360							
Stratum	E	T1		T2		T3		S1		S2/Seedlings		
Height range (m)								2	5	0.1	0.5	
Canopy cover (%)								5				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia melvillei							3	
Panicum coloratum								
Calotis cuneata								
Cenchrus ciliata								
Aristida sp.								
Glandularia aristigera								
Malvastrum coromandelianum								
Rapistrum rugosum								
Capparis lasiantha								
Rhagodia spinescens								
Abutilon sp.								
Sclerolaena sp.								
Opuntia aurantiaca								
Chenopodium sp.								
Physalis angulata								

Ecological Field Survey ORG-ABW-HSM-FOR-00057

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	307 →				→	
Native perennial grass						
Native other grass (if relevant)						
Native forbs and other species (non-grass)	2	70	80	80	70	
Native shrubs (<1m)						
Non-native grass					15	
Non-native forbs and shrubs						
Litter	178	15	PD 15	20	15	
Rock						
Bare ground	80	15	5			
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	non-rem	—	—	—
Survey result	non-rem (cleared)		—	—
Agree with mapped RE? If no, provide justification from field data				

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	0	No. of logs (>10cm)	0
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	0

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

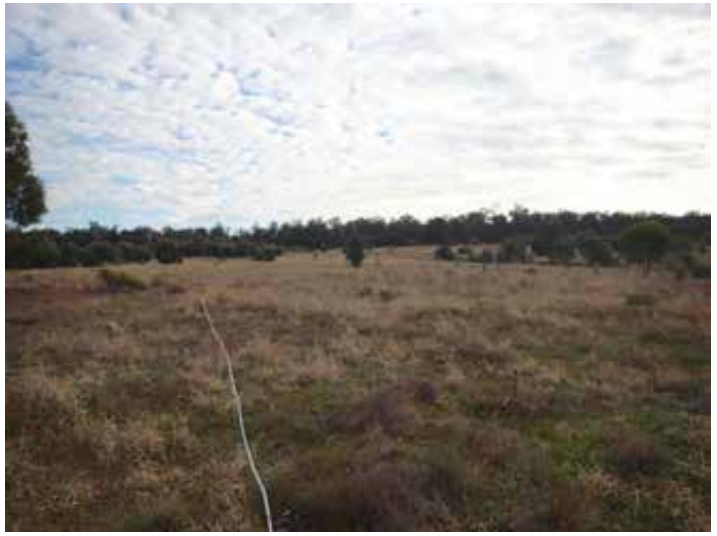
AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	Yes	No	Potential for Grey Snake
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / No		Is the vegetation suitable for slashing only?
	Yes / No		Is the slope < 5%?
	Yes / No		Is the clay content > 20%?
	Yes / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	No	
Notes			

Cleared and undiff. regrowth (Acacia oswaldii)

North face of transect

East face of the transect

South face of the transect



West face of the transect

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Wyalla- T1	**Date:**	24.06.2024
Tenure:	PL493	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	281005
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7011980
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 6284		#	
East	# ↓		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	('Sandy loam')	**'Loam'**	**'Silty loam'**		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion		(Absent)	Scattered		Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	14					**Avg DBH (cm) of EDL**			26			
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)			n/a	
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse			Very sparse			Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	Scattered				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey (SEE ALSO FORM FOR FAUNA) targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SE	Start Easting	280988	End Easting	281023
		Start Northing	7011985	End Northing	7011958

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		12 | 16	8 | 10	4 | 6	1 | 2	0-1 | 2-3
Canopy cover (%)		10	10	5	3	15

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. populnea		2		2				
E. crebra		3		3				
Angophora leiocarpa		4		4				
Allocasuarina luehmannii		100			5	1	25	35
Acacia leiocalyx		2					2	
Acacia crassa		2						2
Heteropogon contortus								
Cheilanthes sieberi								
Aristida caput-medusae								
Paluicum sp.								
Chaetia aristata								
Chrysocephalum apiculatum								
Opuntia tomentosa								
Eragrostis elongata								
Cyperus eragrostis								
Brachyscome multifida								

Ecological Field Survey [illegible]

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	6379	→	→	→	→	
Native perennial grass	5			5	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	3			5	5	
Native shrubs (<1m)						
Non-native grass	2				5	
Non-native forbs and shrubs						
Litter	65	20	40	50	40	
Rock						
Bare ground	20	80	60	40	40	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.5.1	N/A	LC	NCAP
Survey result	11.5.1	〃	〃	〃
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	M	No. of hollow logs	V	Total length of logs (>10cm)	C	No. of logs (>10cm)	3
Per hectare (x 20)	x	Per hectare (x 20)	~	Per hectare (x 20)	120	Per hectare (x 20)	60

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species	
V	Vulnerable		
NT	Near Threatened		
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds	
CBS	Colonial Breeding Species		

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes	No	
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No Yes / No Yes / No Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Wyalla-T2	**Date:**	24.6.2021
Tenure:	PL 493	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	280235
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7011940
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# G 406		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)										
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:				
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance				
Dieback	0%	1-25%	26-75%	>76%	n/a					
Site condition	Very good	Good	Moderate	Poor	Degraded					
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**			
Disturbance notes										

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G
Avg height (m) of EDL	12					**Avg DBH (cm) of EDL**			23		
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey

target zero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SW	Start Easting	280248			End Easting	280219				
		Start Northing	7011958			End Northing	7011920				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		0	14	8	10	2	4	1	2	0.1	0.3
Canopy cover (%)		15		5		5		5		10	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
[illegible]				15	6			
Angophora leiocarpa				7				
Acacia shirleyi					11			
Acacia leiocalyx							6	
Acacia conferta							3	
Alphitonia excelsa							3	
Calytrix aspera								
Dianella spp.								
Chrysanthasscirpus								
Aristida caput-medusae								
Lomandra longifolia								
Sida spp.								
Entolasia stricta								

Ecological Field Survey [illegible]

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	6401	→	→	→	→	
Native perennial grass	30	20	15	20	30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	5			10	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	50	60	70	70	40	
Rock						
Bare ground	10	15	15	10	20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.7	N/A	LC	NCAP
Survey result	11.7.7	V	V	Y
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	10	No. of logs (>10cm)	5
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	200	Per hectare (x 20)	100

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	No. of trees with hollows (>30cm)	X

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing,
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Wyalla - T3	Date:	22.06.2024
Tenure:	PL 493	Assessor(s):	Nazim uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	280459
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7012440
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 6429		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent		Scattered		Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	13		**Avg DBH (cm) of EDL**	25	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	N	Start Easting	280456			End Easting	280465				
		Start Northing	7012415			End Northing	7012462				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		12	14	6	10	4	6	1	2	0.1	0.3
Canopy cover (%)		15		10		5		3		20	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. fibrosa		18		13	2	3		
Acacia shirleyi		34		14	17	2		
Angophora leiocarpa		2		2				
Acacia leiocalyx		33					21	12
Acacia confervida								14
Olearia elliptica								
Eucalyptus sclerophylla								
Banksia spp.								
Grevillea spp.								

Ecological Field Survey ([illegible])

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	6424	→	→	→	→	
Native perennial grass	60	20	15	50	30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	40	70	80	40	60	
Rock						
Bare ground		10	5	10	10	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.7	N/A	LC	NCAP
Survey result	11.7.7	〃	〃	〃
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	17	No. of logs (>10cm)	7
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	340	Per hectare (x 20)	140

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	No. of trees with hollows (>30cm)	X

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero ► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Wyalla - T4 PL 493	**Date:**	24.06.2024
Tenure:		**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	280645
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7012993
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 6449		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%	26-75%	>76%	n/a		
Site condition	Very good	Good	Moderate	Poor	Degraded		
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	14		**Avg DBH (cm) of EDL**	24	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NE	Start Easting	280624			End Easting	280670				
		Start Northing	7012984			End Northing	7012996				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		12	14	6	9	2	4	1	2	0.1	0.3
Canopy cover (%)		12		6		5		5		15	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Corymbia watsoniana		9		7	2			
E. fibrosa		18		12	3	3		
Acacia shirleyi		13		6	3	4		
Acacia leiocalyx		55					32	23
Acacia concurva		12						12
Cheilanthes sieberi								
Entolasia stricta								
Dianella caerulea								
Dodonaea triangularis								
Panicum spp.								

Ecological Field Survey

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	6444	→	→	→	→	
Native perennial grass	10	60	25	30	30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)				5	5	
Non-native grass						
Non-native forbs and shrubs						
Litter	60	35	70	50	55	
Rock						
Bare ground	30	5	5	15	10	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.7	N/A	LC	NCAP
Survey result	11.7.7	11	11	11
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	51	No. of logs (>10cm)	23
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	1020	Per hectare (x 20)	460

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	No. of trees with hollows (>30cm)	X

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Wyalla - T5	**Date:**	25.06.2024
Tenure:	PL 493	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	282900
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014855
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# C4982		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	(NW)	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	12				**Avg DBH (cm) of EDL**		20					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
opuntia stricta	scattered				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey [illegible] targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NW	Start Easting	282923			End Easting	282879				
		Start Northing	7014844			End Northing	7014859				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		10	14	6	8	2	4	1	2	1	0.5
Canopy cover (%)		5		10		10		5		15	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Angothora leiocarpa		5		5				
E. eyreya		3		3				
Allocasuarina luehmannii		76		4	35	15	15	12
Callitris glaucophylla		11			3		5	3
Acacia leiocalyx		3					3	
E. woollsiana		2		2				
Cheilanthes sibirí								
Panicum coloratum								
Dianella sp.								
Panicum decompositum								
Brachyscome multifida								
Aristida caput-medusae								
Fimbristylis dichotoma								

Ecological Field Survey [illegible]

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	6477	→	→	→	→	
Native perennial grass	20	20	20	15	15	
Native other grass (if relevant)						
Native forbs and other species (non-grass)		10	15	20	10	
Native shrubs (<1m)					10	
Non-native grass						
Non-native forbs and shrubs						
Litter	60	50	40	30	25	
Rock						
Bare ground	20	20	25	35	30	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.5.1 Regrowth	N/A	LC	NCAP
Survey result	11.5.1 Regrowth	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	32	No. of logs (>10cm)	13
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	640	Per hectare (x 20)	260

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for nectar / pollen	Absent	(Scattered)	Common	Abundant
Potential for fleshy fruiting plants	Absent	(Scattered)	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	(Common)	Abundant
Dense shrub/grass shelter	Absent	Scattered	(Common)	Abundant
Large Eucalypts (>30cm DBH)	Absent	(Scattered)	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	(Absent)	Scattered	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	(Absent)	Scattered	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	(Scattered)	Common	Abundant
Termite mounds (>50cm)	(Absent)	Scattered	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	Absent	(Scattered)	Common	Abundant
Soil cracks	Absent	(Scattered)	Common	Abundant
Koala feed trees	(Absent)	Scattered	Common	Abundant
Mistletoe/Epiphytes	(Absent)	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing -
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Regrowth vegetation.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	Kyalla - T6	Date:	25.02.2024
Tenure:	PL 493	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	282890
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7014582
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 6499		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	(NW)	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

targetzero

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	18					**Avg DBH (cm) of EDL**			30			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey data sheet for use with

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NW	Start Easting	282872	End Easting	282910		
		Start Northing	7814603	End Northing	7814565		
Stratum	E	T1	T2	T3	S1	S2/Seedlings	
Height range (m)	1	16 | 20	8 | 12	2 | 6	1 | 2	0.1 | 0.9	
Canopy cover (%)		17	5	5	5	10	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. terreticornis		19		13	6			
Allocasuarina huegeliana		23		6		2		15
E. camaldulensis		3		3				
Acacia ligulata		12				6	4	2
Acacia cyclops		2						2
Acacia stenoptera		3				3		
Fourcroya tenuispira								
Gahnia ancora								
Juncus pallidus								
Dianella caerulea								
Arthropodium capillipes								
Cyperus spp.								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) = Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	6489	→	→	→	→	
Native perennial grass	10	20	40	25	30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)				5		
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	60	40	40	40	35	
Rock						
Bare ground	30	40	20	30	35	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (30)	11.3.25	N/A	OC	OC
Survey result	11.3.25	N/A	OC	OC
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	23	No. of logs (>10cm)	7
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	460	Per hectare (x 20)	140

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	Grey snake.
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Ok is a make around vegetation. ESA safe zone, that needs extention based on survey data.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR 3

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Wyalla - TF	**Date:**	25.06.2024
Tenure:	PL 493	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	283380
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7015098
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Facilities infrastructure

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 6524		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**	**'Sandy clay loam'**	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**	**'Medium clay'**	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)
Erosion	(Absent)	Scattered	Frequent
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2			G
Avg height (m) of EDL	3					**Avg DBH (cm) of EDL**			7			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Epacris glacialis	scattered				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey (as per NSW ROP 004) targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)							
Transect Start compass bearing	SE	Start Easting	283371	End Easting	283390		
		Start Northing	7015119	End Northing	7015076		
Stratum	E	T1	T2	T3	S1	S2/Seedlings	
Height range (m)				2 | 4	1 | 2	0.1 | 0.5	
Canopy cover (%)				20	5	10	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia leiocalyx						17	22	16
Cheilanthes sieberi								
Aristida capit-medusae								
Fimbristylis dichotoma								
Panicum decompositum								
Glandularia aristigera								
Chrysocephalum apiculatum								
Euphorbia spp.								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #						
Native perennial grass	10	5	10	10	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5	5	25	20		
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs		5				
Litter	25	70	45	40	40	
Rock	30	5	5	15	30	
Bare ground	30	10	15	15	20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE Govt.	11.7.4/11.7.7/11.7.5		LC	NCAP
Survey result	11.7.5			
Agree with mapped RE? If no, provide justification from field data	YES shrubs (mainly Acacia / eucalypt) on deeply weathered coarse-grained sedimentary rocks			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	Y	No. of hollow logs	Y	Total length of logs (>10cm)	Y	No. of logs (>10cm)	Y
Per hectare (x 20)	Y	Per hectare (x 20)	Y	Per hectare (x 20)	Y	Per hectare (x 20)	Y

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species	
V	Vulnerable		
NT	Near Threatened		
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds	
CBS	Colonial Breeding Species		

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation Clearing
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment:	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
Suitable – if all 4 questions are yes	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Shrublands mainly Acacia leiocalyx in deeply weathered coarse-grained Sedimentary rocks.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

(TR 4)

Ecological Field Survey ORG-ARW-HSM-FOR-00057

targetzero
► zero incidents ► zero harm

SITE IDENTIFICATION			
Site Name:	Wyalla - T8	**Date:**	25.02.2024
Tenure:	PL 403	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	283873
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014446
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 6542		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (*field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content*)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	14					**Avg DBH (cm) of EDL**			24			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
asparagus aethiopica	scattered				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NE	Start Easting	283848			End Easting	283894				
		Start Northing	7014443			End Northing	7014452				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)	1	12	16	6	8	2	6	1	2	0.1	0.5
Canopy cover (%)		10		7		10		7		12	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. fibrosa				6	3		3	
Acacia leiocalyx						3	10	15
Acacia aulacocarpa							7	3
Alphitonia excelsa								2
Chloris aspera								
Aristida spp.								
Fimbristylis dichotoma								
Dianella caerulea								
Melanthes biserrata								
Panicum spp.								
Solanum spp.								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) = Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	4537	→	→	→	→	
Native perennial grass	30	10	20	30	20	
Native other grass (if relevant)	10					
Native forbs and other species (non-grass)		10	10	15	20	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	30	70	50	45	40	
Rock						
Bare ground	30	10	20	10	20	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (Grad.)	Non-rem	N/A	N/A	N/A
Survey result	11.7.7 (Regrowth)	"	Lc	NC
Agree with mapped RE? If no, provide justification from field data	No. the vegetation characteristics match with 11.7.7 and it does not fulfill the criteria to be Remnant.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	29	No. of logs (>10cm)	13
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	580	Per hectare (x 20)	260

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	No. of trees with hollows (>30cm)	X

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

gf is a RE 11.7.7 Regrowth.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

GRS

targetzero

SITE IDENTIFICATION			
Site Name:	Kyoll - T9	**Date:**	25 06 2024
Tenure:	PL493	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	283635
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7015118
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 6562		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	(**'Sandy loam'**)	**'Loam'**	**'Silty loam'**		
	'Sandy clay loam'	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	12		**Avg DBH (cm) of EDL**	18	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Olearia ciliata	Scattered				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey (as per NSW ROM for 2008)

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	283640	End Easting	283628
		Start Northing	7815138	End Northing	7015093

Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		10	14	6	8	2	4	1	2	0.1	2.1
Canopy cover (%)		10		2		3		10		15	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. viatora		12		9	1	2		
corymbia trachyphloia		4		3	1			
Acacia leiocalyx		31				6	15	10
Acacia concurrens		13					8	5
Acacia aprepta		8						8
Dodonaea triangularis								
Alphitonia excelsa								
Pimbristylis dichotoma								
Chrysopogon fallax								
Entolasia stricta								
Dianella caerulea								
Aristida caput-medusae								
Glycine aptera								

Ecological Field Survey [illegible]

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	6557	→	→	→	→	
Native perennial grass	10	50	60	15	30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	20	10	10	10	15	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	60	30	25	40	40	
Rock						
Bare ground	10	10	5	35	15	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	NA	Le	NCAP
Survey result	11.7.4	11	11	11
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	25	No. of logs (>10cm)	11
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	500	Per hectare (x 20)	220

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR 6

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Wyalla - T10	**Date:**	25.06.2024
Tenure:	PL 493	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	283921
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7015520
☐ Monitoring	☑ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 6582		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ~~ESU or 100m~~ x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil (field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	13					**Avg DBH (cm) of EDL**			23			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Eucalyptus blakelyi	scattered				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey ... targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SE	Start Easting	283903				End Easting	283941			
		Start Northing	7015530				End Northing	7015505			
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)	1	10	11	6	9	2	4	1	2	0.1	0.9
Canopy cover (%)		7		3		15		7		10	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. crebra		8		6	2			
Alphitonia excelsa		12			4		5	3
Acacia leiocalyx		49				21	25	
Acacia aneura		13					5	6
Acacia cowleana		9					2	7
Allocasuarina luehmannii		17		1			7	9
Dodonaea triangularis								
Panicum sp.								
Enteropogon ramosus								
Aristida caput-medusae								
Arrhenia cupera								
Bothriochloa decipiens								
Eulalia aurea								

Ecological Field Survey [illegible]

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	6577	→	→	→	→	
Native perennial grass	5	30	10	5	20	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)	20		20			
Non-native grass						
Non-native forbs and shrubs						
Litter	60	40	60	65	65	
Rock						
Bare ground	15	30	10	30	15	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	Non-ven	N/A	N/A	N/A
Survey result	11.7.7 Regrowth		LC	NC
Agree with mapped RE? If no, provide justification from field data	NO. vegetation matches with 11.7.7 regrowth.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	0	Total length of logs (>10cm)	17	No. of logs (>10cm)	8
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	380	Per hectare (x 20)	160

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	No. of trees with hollows (>30cm)	X

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearings
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TP 1

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Wyalla - T 19	Date:	26.06 2024
Tenure:	PL 493	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	280337
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7015811
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 6611		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	(N)	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	('Sandy loam')	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion		(Absent)	Scattered		Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	14					**Avg DBH (cm) of EDL**			15			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	N	Start Easting	280332	End Easting	280344
		Start Northing	7015787	End Northing	7015838

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		12 | 16	8 | 10	4 | 6	1 | 2	0·1 | 0·2
Canopy cover (%)		12	8	5	5	10

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. Grevea.		5		5				
E. populnea		2		2				
Bursaphora leiocarpa		4		4				
Allocasuarina leuhmannii		71			14	28	17	12
Callitris glaucophylla		16			5	2	3	2
Acacia leiocalyx							2	
Acacia conferta								
Chamia aspera								
Solanum parvifolium								
Brachyscome sp.								
Aristida caput-medusae								
Panicum decompositum								
Eutolasia stricta								
Sida filiformis								

Ecological Field Survey ORG-ARW-HSM-FOR-00087

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	C006	→	→	→	→	
Native perennial grass	5	5	15	20	5	
Native other grass (if relevant)						
Native forbs and other species (non-grass)			5	5	15	
Native shrubs (<1m)				5		
Non-native grass						
Non-native forbs and shrubs						
Litter	75	85	65	50	40	
Rock						
Bare ground	20	10	15	20	40	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.5.20	NA	LC	NC
Survey result	11.5.20	〃	〃	〃
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	11	No. of logs (>10cm)	3
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	220	Per hectare (x 20)	60

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR2

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero harm

SITE IDENTIFICATION			
Site Name:	Wyalla - T12	Date:	26.06.2024
Tenure:	PL493	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	280639
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7015024
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 6239		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	E	W	NE	(NW)	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red	Black	Grey	Pale	Dark	Mottled
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)
Erosion	(Absent)	Scattered	Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank										

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%	26-75%	>76%	n/a		
Site condition	Very good	Good	Moderate	Poor	Degraded		
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	15		**Avg DBH (cm) of EDL**	24	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
OPUNTIA TOMENTOSA	Scattered				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NW	Start Easting	280660	End Easting	280622
		Start Northing	7015015	End Northing	7015040

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		14 | 18	6 | 10	2 | 4	1 | 2	0.1 | 0.9
Canopy cover (%)		35	5	2	2	10

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus woollsiana		29		18	8	3		
Grevillea glauophylla		1			1			
Alstonia constricta		5					5	
Acacia leiocalyx		2					2	
Acacia coriacea.		3					3	
Panicum coloratum								
Dichanthium sericeum								
Bothriochloa spp.								
Aristida caput-medusae								
Fimbristylis dichotoma								
Eulalia aristata.								
Panicum spp.								
Spinifex hirsutus.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	6634	→	→	→	→	
Native perennial grass	15	20	15	15	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5	5			10	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	40	45	40	40	30	
Rock						
Bare ground	40	30	45	45	50	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.5.20	N/A	LC	NC
Survey result	11.5.20	V	11	V
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	11	No. of logs (>10cm)	4
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	220	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment:	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
Suitable – if all 4 questions are yes	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR 3

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	Kiyama-T13 PL493	Date:	26.06.2024
Tenure:		Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	280835
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7014416
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# (677		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ~~ESU or~~ 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))		Moderately sloping (5-10%)		Strongly sloping (11-24%)		
	Moderately steep (25-38%)	Steep (39-55%)		Very steep (56-100%)		Slope >100% (45°)		
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow		Orange		Brown		Red	
	Black	Grey		Pale		Dark		Mottled	
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'		'Loam'		'Silty loam'	
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'		'Light clay'		'Light medium clay'	
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion		(Absent)		Scattered				Frequent	
Erosion Type	Tunnelling	Sheet	Rill	Gully		Mass failure		Stream-bank	

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	14		**Avg DBH (cm) of EDL**	24	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Spyridium ericoides	Scattered.				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SE	Start Easting	280833	End Easting	280823
		Start Northing	7013952	End Northing	7013907

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		12 | 16	8 | 10	2 | 4	1 | 2	0.1 | 0.9
Canopy cover (%)		25	5	5	2	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. fibrosa		25		18	5	3		
Acacia shirleyi		4				4		
E. woollsiana		2			2			
Acacia harpophylla		17				2	5	10
Acacia conferta		2					2	
Dodonaea triangularis								
Chenopodium asperum								
Dianella caerulea								
Eutaxia stricta								
Paspalum spp.								
Chelanthes sieberi								
Opuntia stricta								
Lomandra confertus								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	6672	→	→	→	→	
Native perennial grass	20	15	20	30	40	
Native other grass (if relevant)	5					
Native forbs and other species (non-grass)	10					
Native shrubs (<1m)	5		5	10		
Non-native grass						
Non-native forbs and shrubs						
Litter	40	60	55	40	30	
Rock						
Bare ground	25	25	20	20	30	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.7	NA	LC	NC
Survey result	11.7.7	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	3	No. of logs (>10cm)	4
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	180	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	No. of trees with hollows (>30cm)	X

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / (No)		Is the vegetation suitable for slashing only?
	(Yes) / (No)		Is the slope < 5%?
	(Yes) / (No)		Is the clay content > 20%?
	(Yes) / (No)		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR 4

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero

SITE IDENTIFICATION			
Site Name:	Kiyalla - T14	Date:	26.06.2024
Tenure:	PL 493	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	280829
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7013931
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 6686		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ~~ESU or 100m x 100m~~ area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	15				**Avg DBH (cm) of EDL**		13					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	280833	End Easting	280823
		Start Northing	7013952	End Northing	7013907

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		12 | 14	6 | 8	3 | 5	1 | 2	0·1 | 0·9
Canopy cover (%)		15	5	8	2	3

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. Grebra				9	7	5		
E. Woollsiana				1				
E. Populnea				1				
Allocasuarina luehmannii					10	11	6	5
E. fibrosa					7	3		
Acacia leiocalyx							1	5
Acacia conferta.							.5	10
Echania aspera								
Aristida caput-medusae.								
Panicum coloratum								
Dianella caerulea								
Solanum parvifolium								
Glandularia aristigera								
Brachyscome spp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	6681	→				
Native perennial grass	5		15	10	5	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	15	5	5	15		
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	60	70	60	50	65	
Rock						
Bare ground	20	30	20	25	30	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.7	NA	LC	NC
Survey result	11.7.7	〃	〃	〃
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	17	No. of logs (>10cm)	8
Per hectare (x 20)	20	Per hectare (x 20)	20	Per hectare (x 20)	340	Per hectare (x 20)	80

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	No. of trees with hollows (>30cm)	X

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment:	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
Suitable – if all 4 questions are yes	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TF 5

Ecological Field Survey ORG-ARW-HSM-FOR-0006?

targetzero
► zero rodents ► zero navies

SITE IDENTIFICATION			
Site Name:	Wyalla – T15	Date:	26.06.2024
Tenure:	PL493	Assessor(s):	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	281525
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7014288
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 6709		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2			G
Avg height (m) of EDL	12					**Avg DBH (cm) of EDL**			26			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)			n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse			Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
agrostis stricta	Scattered				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	SE	Start Easting	281509			End Easting	281543						
		Start Northing	7014306			End Northing	7014265						
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)		12	14	5	8	2	4	1	2	0.1	0.8		
Canopy cover (%)		5		5		5		5		—			
Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed										
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2					
		TOTALS											
E. populnea		8		5	3								
Allocasuarina luehmannii		7			3	2	2						
Acacia leiocalyx		8				2	3	3					
Acacia shirleyi		3					3						
E. woollsiana		1		1									
Entolasia stricta													
Fimbristylis dichotoma													
Chelaxtus silberi													
Glandularia aristigera													
Panicum decompositum													
Cymbopogon refractus													
Aristida caput-medusae													
Spinifex stricta													

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	6704					
Native perennial grass	5	10	10	10	15	
Native other grass (if relevant)			5	5	5	
Native forbs and other species (non-grass)						
Native shrubs (<1m)		10				
Non-native grass						
Non-native forbs and shrubs						
Litter	80	60	55	45	35	
Rock						
Bare ground	15	20	30	40	45	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	Non-Rem	N/A	N/A	N/A
Survey result	11.5.1 Regrowth	"	LC	NC
Agree with mapped RE? If no, provide justification from field data	NO. The vegetation characteristics match with to be 11.5.1 Regrowth.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	X	No. of logs (>10cm)	X
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	X

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Non-remnant – grassland with scattered trees. Yet it is along the Taylors Rd. The Rd reserve is mainly dominated with E. populnea.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR

targetzero
► zero incidents ► zero harm

SITE IDENTIFICATION			
Site Name:	Wyalla – T16	**Date:**	26.06.2024
Tenure:	PL 493	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	281603
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013813
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

laydown

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 6726		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	(Alluvial plain or flat, flood plain)	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ~~ESU or 100m~~ x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	**'Loam'**	**'Silty loam'**		
	('Sandy clay loam')	**'Clay loam'**	**'Clay loam sandy'**	**'Silty clay loam'**	**'Light clay'**	**'Light medium clay'**		
	'Medium clay'	**'Medium heavy clay'**	**'Heavy clay'**	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL						**Avg DBH (cm) of EDL**						
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	Scattered				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	SE	Start Easting	281594	End Easting	281609							
		Start Northing	7013836	End Northing	7013788							
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)											0·1	0·7
Canopy cover (%)												

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Arishita cygut. meduse								
fimbristylis dichotoma								
Cheilanthes sieberi								
Glandularia aristigera								
Sclerolaena birchii								
Eragrostis spp.								
Paspalidium distans								
calotis lappulacea								
opuntia tomentosa								
Mairena microphylla								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #						
Native perennial grass	15	25	15	10	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	15	10	15	20	5	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	50	40	40	45	30	
Rock						
Bare ground	20	25	30	25	55	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	Non-rem	NA	NA	NA
Survey result	Non-rem (derived grassland)			
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)		No. of hollow logs		Total length of logs (>10cm)		No. of logs (>10cm)	
Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)		Per hectare (x 20)	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	(Yes)	No	
Notes			

Grassland with mostly native species - scattered soil cracks

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR7

targetzero

SITE IDENTIFICATION			
Site Name:	Wyalla - T17	**Date:**	26.07.2021
Tenure:	PL193	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	281618
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013126
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 6747		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	(SW)	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil (field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	(Sandy loam)	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:		
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance		
Dieback	0%	1-25%	26-75%	>76%	n/a			
Site condition	Very good	Good	Moderate	Poor	Degraded			
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**	
Disturbance notes								

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	15		**Avg DBH (cm) of EDL**	22	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	Scattered				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	SW	Start Easting	28 633			End Easting	28 598				
		Start Northing	70 3204			End Northing	70 3194				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		14	18	5	8	3	6	1	2	0.1	0.6
Canopy cover (%)		20		10		5		7		5	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. crebra		8		6	2			
Angophora leiocarpa		2		1	1			
Allocasuarina luehmannii		30		3	12	6	7	2
Acacia leiocalyx		54				32	19	3
Acacia concerta		5						5
E. fibrosa		3		2	1			
Grevillea asperula								
Dianella caerulea								
Panicum effusum								
Dodonaea triangularis								
Entolasia stricta								
Aristida caput-medusae								
Spyridium scutellifolium								

Ecological Field Survey (see overleaf for key)

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	6742	→	→	→	→	
Native perennial grass	10		15	5	10	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10		5			
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	40	50	60	55	60	
Rock						
Bare ground	40	50	20	40	30	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.5.20	NA	LC	NC
Survey result	11.5.20	11	11	11
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	27	No. of logs (>10cm)	11
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	540	Per hectare (x 20)	220

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER HABITAT within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered	**Special Least Concern Species** Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	**Colonial Breeding Species** Microbats, wetland birds
CBS	Colonial Breeding Species	

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment:	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
Suitable – if all 4 questions are yes	Yes / (No)		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T1	**Date:**	20/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	0282345
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7015576
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#362		#	
East	#363		#	
South	#364		#	
West	#365		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain☑
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N☑	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’☑	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry☑	Cropping	Conservation	Mining	Other:						
Evidence	Clearing☑	Cultivation	Regrowth☑	Logging	Thinning	No disturbance						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate☑	Poor	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Regrowth woodland											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑	T2	S1	S2	G							
Avg height (m) of EDL	10.5	**Avg DBH (cm) of EDL**	20									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% ☑ (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse☑	Very sparse	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below	Not Found On Site☑

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	SE	Start Easting		0282341		End Easting							
		Start Northing		7015592		End Northing							
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			8	14	4	8	2	4	1	2	0.1	1	
Canopy cover (%)			30		15		10		5				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina luehmannii		49		36	6	1	6	
Acacia loroloba		20					20	
Acacia leiocalyx		1						1
Callitris glaucophylla							1	
Lomandra sp.								
Hibiscus sturtii								
Calotis cuneifolia								
Dysphania sp.								
Cheilanthes sp.								
Aristida caput-medusae								
Eragrostis sp.								
Paspalidium sp.								
Lepidosperma laterale								
Alphitonia excelsa								
Diplachne sp.								
Panicum sp.								
Chloris ventricose								
Cymbopogon refractus								
Walwhalleya sp.								
Ancistrachne uncinulata								
Dianella longifolia								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Bothriochloa sp.								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #						
Native perennial grass		3	2	10		3
Native other grass (if relevant)						
Native forbs and other species (non-grass)		1	1	10	10	4.4
Native shrubs (<1m)			15	10		5
Non-native grass						
Non-native forbs and shrubs						
Litter	95	91	77	60	80	80.6
Rock						
Bare ground	5	5	5	10	10	7
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1 Regrowth	-	Least concern	No Concern at Present
Survey result	11.5.1 Regrowth	-	Least concern	No Concern at Present
Agree with mapped RE? If **no**, provide justification from field data	Yes.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**20**	**No. of logs (>10cm)**	**5**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**400**	**Per hectare (x 20)**	**100**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered☑	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered☑	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered☑	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered☑	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered☑	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common☑	Abundant
Coarse woody debris	Absent	Scattered☑	Common	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered☑	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common☑	Abundant
Mistletoe/Epiphytes	Absent	Scattered☑	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No Significant Ground Disturbance** ☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Yes, but a sandy plain on land zone 5.** ☑
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**No, predominantly sandy** ☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**No, not within 50m of water** ☒
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☒	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	Nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Potential for woodland bird nests.
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	General habitat for Koala.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No ☑ Yes ☑ / No Yes / No ☑ Yes ☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

11.5.1 regrowth. Well pad is placed entirely within the regrowth.
Vegetation community contains Koala feed tree species.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T2	**Date:**	20/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0282003
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7015577
☐ Monitoring	☒ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#375		#	
East	#376		#	
South	#377		#	
West	#378		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain☑
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N☑	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’☑	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing☑	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate☑	Poor	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑	T2	S1	S2	G							
Avg height (m) of EDL	13	**Avg DBH (cm) of EDL**	20									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse) ☑	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse☑	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below☑	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia stricta	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	W		Start Easting		0281980		End Easting		0282025				
			Start Northing		7015588		End Northing		7015566				
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)	17	19	10	15	6	10	3	6	1	3	0.1	1	
Canopy cover (%)	5		20		15		5		5				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra		*7*	1	4	2			
Eucalyptus populnea		*7*		5	2			
Allocasuarina luehmannii		*4*		2	2			
Callitris glaucophylla		*8*		8				
Acacia leiocalyx		*2*				1	1	
Acacia loroloba		*3*					3	
Aristida caput-medusae								
Aristida sp.								
Panicum sp.								
Phyllanthus virgatus								
Dianella caerulea								
Cheilanthes sieberi								
Eragrostis sp.								
Cyanthillium cinereum								
Ancistrachne uncinulata								
Lomandra longifolia								
Lomandra leucocephala								
Cymbopogon refractus								
Setaria sp. *(Paspalidium* sp.*)*								
Lysiana exocarpi								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #						
Native perennial grass	10	30	25	45	25	27
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	75	70	35	48	70	59.6
Rock						
Bare ground	15		30	7	5	11.4
Cryptogams			10			2
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1 Regrowth	-	Least concern	No Concern at Present
Survey result	11.5.1 Regrowth		Least concern	No Concern at Present
Agree with mapped RE? If **no**, provide justification from field data	Yes. Poplar Box dominant			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**1**	**Total length of logs (>10cm)**	**7**	**No. of logs (>10cm)**	**2**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**20**	**Per hectare (x 20)**	**140**	**Per hectare (x 20)**	**40**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered☑	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent	Scattered☑	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered☑	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered☑	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered☑	Common	Abundant
Coarse woody debris	Absent	Scattered☑	Common	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered☑	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common☑	Abundant
Mistletoe/Epiphytes	Absent	Scattered☑	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance.** ☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Yes.** ☑
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**No. Sandy soils.** ☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**No water within 50m.** ☒
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☒	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: **Animal tracks** **Feed scars** **Scratches** **Diggings** **Scats** **Casts** **Bones** **Feathers** **Other**

Breeding places: **Nests** **Burrows** **Shelters** **Drays** **Bowers** **Other**

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Potential for nests and koala presence.
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	Koala feed trees present.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

11.5.1 Regrowth. Koala feed trees present.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T3	**Date:**	20/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0281747
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7015607
☐ Monitoring	☒ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#384		#	
East	#385		#	
South	#386		#	
West	#387		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain☑
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N☑	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’☑	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing	Forestry☑	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging☑	Thinning	No disturbance						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good☑	Moderate	Poor	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑	T2	S1	S2	G							
Avg height (m) of EDL	17	**Avg DBH (cm) of EDL**	30									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse) ☑	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse☑	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below	Not Found On Site☑

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	LOW				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	W	Start Easting	0281770			End Easting	0281721						
		Start Northing	7015602			End Northing	7015611						
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)			16	20	10	16	5	10	3	5	0.1	3	
Canopy cover (%)		20		30		15		5		5			

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus tereticornis		6		1			1	4
Eucalyptus populnea		2		1	1			
Eucalyptus crebra		6			1	1		2
Allocasuarina luehmannii		5			1	2		1
Angophora leiocarpa		6			1			5
Callitris glaucophylla		9			8	1		
Cassinia laevis		1						1
Acacia loroloba		5					1	4
Geijera parviflora		1						1
Pimelea neo-anglica		2						2
Aristida caput-medusae								
Lomandra sp.								
Calotis cuneifolia								
Sida trichopoda								
Cyanthillium cinereum								
Aristida calycina								
Hibiscus sturtii								
Eragrostis sp.								
Panicum sp.								
Enteropogon sp.								
Setaria sp. (syn. *Paspalidium*)								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						
Maireana microphylla								
Solanum parvifolium								
Dianella longifolia								
Digitaria sp.								
Opuntia tomentosa								
Cymbopogon refractus								
Entolasia sp.								
Cheilanthes sieberi								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	388	389	390	391	392	
Native perennial grass	39	15	20	2	35	22.2
Native other grass (if relevant)						
Native forbs and other species (non-grass)	1	5	3	3	10	4.4
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	60	80	72	95	55	72.4
Rock						
Bare ground			5			1
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1	-	Least Concern	No Concern at Present
Survey result	11.5.1	-	Least Concern	No Concern at Present
Agree with mapped RE? If **no**, provide justification from field data	Yes.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**28**	**No. of logs (>10cm)**	**6**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**560**	**Per hectare (x 20)**	**120**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered☑	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent	Scattered☑	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common☑	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered☑	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common☑	Abundant
Coarse woody debris	Absent	Scattered	Common☑	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common☑	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common☑	Abundant
Mistletoe/Epiphytes	Absent	Scattered☑	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance.** ☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Yes, plains.** ☑
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**No.** ☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**No.** ☒
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☒	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	Nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Potential for bird nests, arboreal mammals/reptiles.
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	Koala feed trees present.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

A slight depression in the landscape (no discernible drainage feature) allowing for *Eucalyptus tereticornis* to grow in a small area. General structure and species representative of 11.5.1.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T5	**Date:**	21/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0281525
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7015100
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☒ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#444		#	
East	#445		#	
South	#446		#	
West	#447		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain☑
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N☑	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’☑	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing☑	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%☑	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor☑	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Cleared for pasture, but considerable cover of very young Poplar Box regrowth present.											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**☑	**IMP**	**LKE**	**RIP**	**SHR**☑	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1☑		S2		G			
Avg height (m) of EDL	3				**Avg DBH (cm) of EDL**		5					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse) ☑		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse☑		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below	Not Found On Site☑

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	W	Start Easting	0281547			End Easting	0281501						
		Start Northing	7015111			End Northing	7015088						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)									2	4	0.1	0.5	
Canopy cover (%)									20				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus populnea		24					24	
Allocasuarina luehmannii		1					1	
Aristida caput-medusae								
Glandularia aristigera								
Chrysocephalum apiculatum								
Bothriochloa sp.								
Eragrostis sp.								
Cheilanthes sieberi								
Phyla canescens								
Glycine sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	448	449	450	451	452	
Native perennial grass	20	15	15	20	25	19
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	10				4
Native shrubs (<1m)						
Non-native grass			5			1
Non-native forbs and shrubs	4					0.8
Litter	40	30	20	20	60	34
Rock	1					0.2
Bare ground	25	40	60	60	15	40
Cryptogams		5				1
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	Cleared	-	-	-
Survey result	Derived Grassland	-	-	-
Agree with mapped RE? If **no**, provide justification from field data	Yes.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**0**	**No. of logs (>10cm)**	**0**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered☑	Common	Abundant
Potential for **fleshy fruiting plants**	Absent☑	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent	Scattered☑	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent☑	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent☑	Scattered	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered☑	Common	Abundant
Coarse woody debris	Absent☑	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent☑	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered☑	Common	Abundant
Mistletoe/Epiphytes	Absent☑	Scattered	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance.** ☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Plains present.** ☑
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Not present.** ☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Suitable habitat features not present.** ☒
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☐	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: **Animal tracks** **Feed scars** **Scratches** **Diggings** **Scats** **Casts** **Bones** **Feathers** **Other**

Breeding places: **Nests** **Burrows** **Shelters** **Drays** **Bowers** **Other**

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Potential for bird nests.
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	For the potential to be tampering with breeding places.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

A shrubby layer of Poplar Box has seeded and/or regrown from lignotubers in a cleared area adjacent to remnant woodland. Not large enough to map as a community.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T6	**Date:**	21/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0281584
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014923
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☒ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#453		#	
East	#454		#	
South	#455		#	
West	#456		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain☑
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)☑	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW☑	Nil
Soil Colour	White	Yellow	Orange	Brown	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’☑	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate☑	Poor	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑		T2		S1		S2		G			
Avg height (m) of EDL	15				**Avg DBH (cm) of EDL**		30					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse) ☑		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse☑		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below	Not Found On Site☑

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	E	Start Easting	0281562			End Easting	0281603						
		Start Northing	7014934			End Northing	7014904						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			15	18	8	15	3	8	1	3	0.1	1	
Canopy cover (%)			15		25		15		5				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra		*6*		3	2	1		
Eucalyptus populnea		*1*		1				
Allocasuarina luehmannii		*26*			6	6	4	10
Eucalyptus tereticornis		*2*			2			
Callitris glaucophylla		*5*			2	3		
Angophora leiocarpa		*1*				1		
Acacia loroloba		*10*						10
Cassinia laevis		*1*						1
Aristida caput-medusae								
Laxmannia gracilis								
Cheilanthes sieberi								
Panicum sp.								
Aristida calycina								
Bothriochloa sp.								
Cyanthillium cinereum								
Chloris ventricose								
Lomandra sp.								
Lomandra sp. 2								
Fimbristylis dichotoma								
Brunoniella australis								
Glycine sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			**E**	**T1**	**T2**	**T3**	**S1**	**S2**
		TOTALS						
Dianella longifolia								
Cymbopogon refractus								
Calyptochloa gracilis subsp. *gracilis*								
Calotis cuneifolia								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	437	438	439	440	441	
Native perennial grass	15	25	20	55	40	30
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5	10	15	5	5	9
Native shrubs (<1m)			5			1
Non-native grass						
Non-native forbs and shrubs						
Litter	80	35	60	40	40	51
Rock						
Bare ground		30			15	9
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1 Regrowth	-	Least Concern	No Concern at Present
Survey result	11.5.1	-	Least concern	No Concern at Present
Agree with mapped RE? If **no**, provide justification from field data	No. Canopy meets the high and cover thresholds for a remnant community.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**25.5**	**No. of logs (>10cm)**	**8**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**510**	**Per hectare (x 20)**	**6**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered☑	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent	Scattered☑	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered☑	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered☑	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered☑	Common	Abundant
Coarse woody debris	Absent	Scattered	Common☑	Abundant
Termite mounds (>50cm)	Absent	Scattered☑	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent☑	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered☑	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered☑	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance.** ☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Plains present.** ☑
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Absent.** ☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Absent.** ☒
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☒	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: **Animal tracks** **Feed scars** **Scratches** **Diggings** **Scats** **Casts** **Bones** **Feathers** **Other**

Breeding places: **Nests** **Burrows** **Shelters** **Drays** **Bowers** **Other**

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Potential for bird nests and Koala.
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	General habitat for Koala.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

Previously mapped as regrowth 11.5.1; however, canopy measurements put this above the benchmark thresholds.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T7	**Date:**	21/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	0281727
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014846
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#466		#	
East	#467		#	
South	#468		#	
West	#469		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain☑
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)☑	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW☑	Nil
Soil Colour	White	Yellow	Orange	Brown	Red			
	Black	Grey☑	Pale☑	Dark	Mottled			
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’☑	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing☑	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor☑	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Recently cleared for pasture. Acacia regrowth dominant.											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**☑	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1☑		S2		G			
Avg height (m) of EDL	2.5				**Avg DBH (cm) of EDL**		4					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense) ☑		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense☑		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below	Not Found On Site☑

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	N	Start Easting	0281726			End Easting	0281730					
		Start Northing	7014822			End Northing	7014871					
Stratum	E	T1		T2		T3		S1		S2/Seedlings		
Height range (m)								1	4	0.1	1	
Canopy cover (%)								40				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia loroloba		25					25	
Eucalyptus tereticornis		2					2	
Eucalyptus populnea		1					1	
Eucalyptus crebra		1					1	
Aristida caput-medusae								
Cymbopogon refractus								
Dysphania sp.								
Calotis cuneifolia								
Glandularia aristigera								
Wahlenbergia sp.								
Dianella sp.								
Eremophila debilis								
Glycine sp.								
Panicum sp.								
Aristida sp.								
Walwhalleya sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	470	471	472	473	474	
Native perennial grass	2	15	18	5	20	12
Native other grass (if relevant)						
Native forbs and other species (non-grass)	1		2	5	5	2.6
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs	2	5	40	5		10.4
Litter		30				6
Rock	10		10	5	3	5.6
Bare ground	85	50	30	80	72	63.4
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	Cleared	-	-	-
Survey result	Regrowth Undifferentiated	-	-	-
Agree with mapped RE? If **no**, provide justification from field data	No. A distinct shrubby layer of Acacia and Eucalypt species are present.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**0**	**No. of logs (>10cm)**	**0**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered☑	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common☑	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered☑	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent☑	Scattered	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered☑	Common	Abundant
Coarse woody debris	Absent	Scattered☑	Common	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent☑	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered☑	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered☑	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance.** ☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Yes.** ☑
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Absent.** ☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Absent.** ☒
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☒	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: **Animal tracks** **Feed scars** **Scratches** **Diggings** **Scats** **Casts** **Bones** **Feathers** **Other**

Breeding places: **Nests** **Burrows** **Shelters** **Drays** **Bowers** **Other**

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Bird nests may be present in shrub layer.
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	Potential requirement to tamper with breeding places.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ ☑Yes / No Yes / No☑ ☑Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

Acacia shrubs are dominant. Undifferentiated Regrowth.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T8	**Date:**	21/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0281394
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014877
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☒ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#479		#	
East	#480		#	
South	#481		#	
West	#482		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash☑	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil☑
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’☑	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing☑	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good☑	Moderate	Poor	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Edge effects from adjacent clearing.											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑	T2	S1	S2	G							
Avg height (m) of EDL	25	**Avg DBH (cm) of EDL**	45									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse) ☑	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse☑	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below☑	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	W	Start Easting	0281412			End Easting	0281369						
		Start Northing	7014888			End Northing	7014861						
Stratum	E		T1		T2		T3		S1		S2/Seedlings		
Height range (m)			22	30	10	22	3	10	1	3	0.1	1	
Canopy cover (%)			40		20		5		5				

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus tereticornis / *Eucalyptus camaldulensus*		*11*		4	3	1		3
Eucalyptus populnea		*3*			1	2		
Acacia loroloba		*3*						3
Acacia salicina		*1*						1
Pimelea neo-anglica		*1*						1
Cyperus sp.								
Eleocharis sp.								
Arundinella nepalensis								
Glandularia aristigera								
Maireana microphylla								
Sida sp.								
Glycine sp.								
Chrysocephalum apiculatum								
Aristida caput-medusae								
Diplachne fusca								
Carex sp.								
Walwhalleya sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	483	484	485	486	487	
Native perennial grass		20	20	50	20	22
Native other grass (if relevant)						
Native forbs and other species (non-grass)	70	20	5			19
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	30	60	65	50	80	57
Rock						
Bare ground			10			2
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	Cleared	-	-	-
Survey result	11.3.25	-	Least concern	Of concern
Agree with mapped RE? If **no**, provide justification from field data	No. remnant *Eucalyptus tereticornis/Eucalyptus camaldulensis* community present with long standing pools of water along a meandering drainage feature. Meets height and cover for remnant status.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**4**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**7.5**	**No. of logs (>10cm)**	**2**
Per hectare (x 20)	**80**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**150**	**Per hectare (x 20)**	**40**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent		Present☑	
Waterway	Absent		Present☑	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered☑	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common☑	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common☑	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent☑	Scattered	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers☑	Deep layers
Leaf litter coverage	Absent	Scattered	Common☑	Abundant
Coarse woody debris	Absent	Scattered☑	Common	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common☑	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common☑	Abundant
Mistletoe/Epiphytes	Absent☑	Scattered	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance.☑**	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Present.☑**
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Absent ☒**	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Present ☑**
Grey snake habitat PRESENT ☒		**Grey snake habitat ABSENT ☐**	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: **Animal tracks** **Feed scars** **Scratches** **Diggings** **Scats** **Casts** **Bones** **Feathers** **Other**

Breeding places: **Nests** **Burrows** **Shelters** **Drays** **Bowers** **Other**

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Nests may be present within ESU
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	Koala habitat/feed trees present.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

This was previously mapped as a cleared community; however, it presents as mature 11.3.25. This community extends south, adjacent to the ROW.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T9	**Date:**	21/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0281358
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014923
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☒ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#488		#	
East	#489		#	
South	#490		#	
West	#491		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain☑
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N☑	S	E	W	NE	NW	SE	SW	Nil☑
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’☑	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate☑	Poor	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Previously cleared but has regrown within the bend of the adjacent drainage feature.											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑	T2	S1	S2	G							
Avg height (m) of EDL			**Avg DBH (cm) of EDL**									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse) ☑	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse ☑	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below☑	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	W	Start Easting	0281339			End Easting	0281371						
		Start Northing	7014906			End Northing	7014941						
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)		13	16	8	13	3	8	1	3	0.1	1		
Canopy cover (%)		30		15		10		5					

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus populnea		*17*		7	3	5	2	
Callitris glaucophylla		*1*		1				
Acacia loroloba		*10*					7	3
Acacia leiocalyx		*1*					1	
Aristida caput-medusae								
Bothriochloa sp.								
Eragrostis sp.								
Glandularia aristigera								
Arundinella nepalensis								
Lepidosperma laterale								
Cheilanthes sieberi								
Dianella sp.								
Maireana microphylla								
Cymbopogon refractus								
Chloris virgata								
Oxalis sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	492	493	494	495	496	
Native perennial grass		40	40	50	35	33
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter		40	60	50	65	43
Rock						
Bare ground	100	20				24
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	Cleared	-	-	-
Survey result	11.5.1	-	Least concern	No concern at present
Agree with mapped RE? If **no**, provide justification from field data	No. A patch of Poplar Box woodland has regrown within the bend of the adjacent drainage feature.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**0**	**No. of logs (>10cm)**	**0**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered☑	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent	Scattered☑	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered☑	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent☑	Scattered	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered☑	Common	Abundant
Coarse woody debris	Absent	Scattered☑	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered☑	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered☑	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common☑	Abundant
Mistletoe/Epiphytes	Absent	Scattered☑	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**So significant ground disturbance.☑**	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Present.☑**
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Absent. ☒**	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Absent.☒**
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT ☒**	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: **Animal tracks** **Feed scars** **Scratches** **Diggings** **Scats** **Casts** **Bones** **Feathers** **Other**

Breeding places: **Nests** **Burrows** **Shelters** **Drays** **Bowers** **Other**

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Yes, bird nests and Koala habitat present.
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	Koala habitat and food trees present.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			
T1 meets height and cover thresholds.			

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T10	**Date:**	22/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0281300
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014956
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☒ Roads & Tracks	☐ Seismic Line	**Other description**	Extra work area, watercourse crossing
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#513		#	
East	#514		#	
South	#515		#	
West	#516		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash☑	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil☑
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’☑	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing☑	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor☑	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑	T2	S1	S2	G							
Avg height (m) of EDL	15	**Avg DBH (cm) of EDL**	30									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% ☑ (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse ☑	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below☑	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	N	Start Easting		0281310		End Easting		0281291					
		Start Northing		7014934		End Northing		7014981					
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)				14	16	8	14	3	8	1	3	0.1	1
Canopy cover (%)		10		15		5		5					

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus tereticornis				2	9		1	
Eucalyptus populnea				1	2		4	
Acacia sp.							9	
Bothriochloa sp.								
Aristida caput-medusae								
Glandularia aristigera								
Sida sp.								
Eragrostis sp.								
Aristida sp. 2								
Oxalis sp.								
Dianella sp.								
Panicum sp.								
Goodenia sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	517	518	519	520	521	
Native perennial grass	30	20	50	25	18	28.6
Native other grass (if relevant)						
Native forbs and other species (non-grass)					2	0.4
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	40	78	45	50	65	55.6
Rock						
Bare ground	30	2	5	25	15	15.4
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	Cleared	-	-	-
Survey result	11.3.25 Regrowth	-	Least Concern	No Concern at Present
Agree with mapped RE? If **no**, provide justification from field data	No.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**2**	**Total length of logs (>10cm)**	**13**	**No. of logs (>10cm)**	**3**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**40**	**Per hectare (x 20)**	**260**	**Per hectare (x 20)**	**60**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent		Present☑	
Waterway	Absent		Present☑	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent☑	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent☑	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered☑	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent☑	Scattered	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered☑	Common	Abundant
Coarse woody debris	Absent	Scattered	Common☑	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered☑	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered☑	Common	Abundant
Mistletoe/Epiphytes	Absent☑	Scattered	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No Significant Ground Disturbance.** ☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Streams/Water present.** ☑
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Absent.** ☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Present.** ☑
Grey snake habitat PRESENT ☒		**Grey snake habitat ABSENT** ☐	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

Regrowth 11.3.25 with a sparse canopy and small patch size. Would not be map-able as an RE, but still potentially worthy of offsets.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T11	**Date:**	22/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0281790
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013848
☐ Monitoring	☒ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☐ Roads & Tracks	☐ Seismic Line	**Other description**	Extra work area
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#548		#	
East	#549		#	
South	#550		#	
West	#551		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash☑	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil☑
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale☑	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’☑	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent	Scattered☑	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank☑		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing☑	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate☑	Poor	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Cleared up to edge of bank in some areas.											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑	T2	S1	S2	G							
Avg height (m) of EDL	18	**Avg DBH (cm) of EDL**	35									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse) ☑	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse ☑	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below	Not Found On Site☑

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	NW	Start Easting	0281809			End Easting	0281781						
		Start Northing	7013831			End Northing	7013873						
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)			16	21	8	16	3	8	1	3	0.1	1	
Canopy cover (%)		30		15		3		2					

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus tereticornis				8	8	1		
Acacia loroloba							1	
Acacia leiocalyx						1		
Cyperus sp.								
Glandularia aristigera								
Lobelia concolor								
Gylcine sp.								
Sida sp.								
Dichondra repens								
Symphyotrichum subulatum								
Rumex brownii								
Arundinella nepalensis								
Diplachne fusca								
Leersia hexandra								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	552	553	554	555	556	
Native perennial grass	37	15	25	25	15	23.4
Native other grass (if relevant)						
Native forbs and other species (non-grass)	3				5	1.6
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs		10	3		2	3
Litter	60	75	72	75	78	72
Rock						
Bare ground						
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	Cleared	-	-	-
Survey result	11.3.25	-	Least concern	Of Concern
Agree with mapped RE? If **no**, provide justification from field data	No. Mature trees fringing drainage line.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**0**	**No. of logs (>10cm)**	**0**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent		Present☑	
Waterway	Absent		Present☑	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered☑	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common☑	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common☑	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent☑	Scattered	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers☑	Deep layers
Leaf litter coverage	Absent	Scattered☑	Common	Abundant
Coarse woody debris	Absent	Scattered☑	Common	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common☑	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common☑	Abundant
Mistletoe/Epiphytes	Absent	Scattered☑	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance present.☑**	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Streams present.☑**
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Absent.☒**	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Present - . ☑**
Grey snake habitat PRESENT ☒		**Grey snake habitat ABSENT ☐**	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: **Animal tracks** **Feed scars** **Scratches** **Diggings** **Scats** **Casts** **Bones** **Feathers** **Other**

Breeding places: **Nests** **Burrows** **Shelters** **Drays** **Bowers** **Other**

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Mature trees with potential for birds and arboreal animals.
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	Koala feed trees present
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

Transect is curved to follow the vegetation fringing the drainage feature.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T12	**Date:**	22/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0281860
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013814
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☒ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#557		#	
East	#558		#	
South	#559		#	
West	#560		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash☑	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil☑
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’☑	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent	Scattered☑	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank☑		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing☑	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%☑	26-75%	>76%	n/a		
Site condition	Very good	Good	Moderate	Poor	Degraded☑		
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**
Disturbance notes	Recently cleared, young regrowth.						

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1☑	T2	S1	S2	G
Avg height (m) of EDL	8		**Avg DBH (cm) of EDL**	8	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse) ☑	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse☑	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below	Not Found On Site☑

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	SE	Start Easting	0281842			End Easting	0281878						
		Start Northing	7013832			End Northing	7013794						
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)			8	13	2	8			1	2	0.1	1
Canopy cover (%)		10		20				10			

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus tereticornis		*29*		10	13		6	
Acacia loroloba		*1*					1	
Cassinia laevis		*1*					1	
Arundinella nepalensis								
Aristida caput-medusae								
Cymbopogon refractus								
Cheilanthes sieberi								
Sida sp.								
Glandularia aristigera								
Cyperus sp.								
Juncus sp.								
Cyperus sp. 2								
Eragrostis sp.								
Setaria sp. (*Paspalidium* sp.)								
Panicum sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	561	562	563	564	565	
Native perennial grass	60	70	30	15	15	38
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5		10			3
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	35	30	60	85	55	53
Rock						
Bare ground					30	6
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	Cleared	-	-	-
Survey result	Undiff. Regrowth	-	-	-
Agree with mapped RE? If **no**, provide justification from field data	No. Recent regrowth providing connectivity and habitat for fauna.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**0**	**No. of logs (>10cm)**	**0**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent		Present☑	
Waterway	Absent		Present☑	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent☑	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered☑	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered☑	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent☑	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent☑	Scattered	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered☑	Common	Abundant
Coarse woody debris	Absent☑	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered☑	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common☑	Abundant
Mistletoe/Epiphytes	Absent☑	Scattered	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance present.☑**	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Streams present.☑**
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Present. Large pools of water (up to 100x20m) along a distinct drainage feature☑**	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Absent.☒**
Grey snake habitat PRESENT ☒		**Grey snake habitat ABSENT ☐**	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: **Animal tracks** **Feed scars** **Scratches** **Diggings** **Scats** **Casts** **Bones** **Feathers** **Other**

Breeding places: **Nests** **Burrows** **Shelters** **Drays** **Bowers** **Other**

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Yes, clearing vegetation with potential for nests.
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	Yes. At least low risk SMP.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

Young regrowth in an area that looks to have been previously cleared for machinery and vehicle passage.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T13	**Date:**	22/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0282054
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013854
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☒ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#566		#	
East	#567		#	
South	#568		#	
West	#569		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain☑
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale☑	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’☑	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing☑	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%☑	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor☑	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Recently cleared for pasture. Not pasture improved.											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑	T2	S1	S2	G							
Avg height (m) of EDL	N/A	**Avg DBH (cm) of EDL**	N/A									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a☑							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse ☑	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below☑	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia stricta	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	W	Start Easting	0282078			End Easting	0282029						
		Start Northing	7013852			End Northing	7013860						
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)								0.5	3	0.1	0.5		
Canopy cover (%)								5					

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina luehmannii		*24*					24	
Aristida caput-medusae								
Sphaeromorphaea australis								
Eragrostis sp.								
Wahlenbergia sp.								
Maireana microphylla								
Digitaria sp.								
Chrysocephalum apiculatum								
Panicum sp.								
Calotis lappulacea								
Sclerolaena birchii								
Aristida sp. 2								
Cheilanthes sieberi								
Glandularia aristigera								
Chloris ventricosa								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	570	571	572	573	574	
Native perennial grass	20	10	40	20	30	24
Native other grass (if relevant)						
Native forbs and other species (non-grass)	15	10	15	5	5	10
Native shrubs (<1m)				50		10
Non-native grass						
Non-native forbs and shrubs						
Litter	65	75	40	25	65	54
Rock						
Bare ground		5	5			2
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1 Regrowth	-	-	-
Survey result	Derived Grassland	-	-	-
Agree with mapped RE? If **no**, provide justification from field data	No. Has been recently cleared for pasture. Not pasture improved, mostly native ground cover.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**0**	**No. of logs (>10cm)**	**0**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered☑	Common	Abundant
Potential for **fleshy fruiting plants**	Absent☑	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent	Scattered☑	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent☑	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent☑	Scattered	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered☑	Common	Abundant
Coarse woody debris	Absent	Scattered☑	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered☑	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent☑	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent☑	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent☑	Scattered	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance.**☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Absent.**☒
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Absent**☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Absent.**☒
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☒	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: **Animal tracks** **Feed scars** **Scratches** **Diggings** **Scats** **Casts** **Bones** **Feathers** **Other**

Breeding places: **Nests** **Burrows** **Shelters** **Drays** **Bowers** **Other**

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Potential for ground dwelling reptiles such as *Tiliqua rugosa*. Bird nests.
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	Some low Allocasuarina luehmanni regrowth.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes ☑/ No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

Spatial imagery of the area shows the 11.5.1 Regrowth was cleared between 2017 and 2019.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T4	**Date:**	21/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0281420
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7015004
☐ Monitoring	☒ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#397		#	
East	#398		#	
South	#399		#	
West	#400		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain☑
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	N☑	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’☑	**‘Loam’**	**‘Silty loam’**			
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**			
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)					
Erosion	Absent☑	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing☑	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a☑							
Site condition	Very good	Good	Moderate	Poor☑	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Cleared for pasture.											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**☑	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G☑			
Avg height (m) of EDL	0.3				**Avg DBH (cm) of EDL**		N/A					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a☑			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent☑			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below	Not Found On Site☑

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	N	Start Easting	0281431	End Easting	0281410							
		Start Northing	7014982	End Northing	7015028							
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)											0.1	0.5
Canopy cover (%)												

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	401	402	403	404	405	
Native perennial grass	30	37	22	45	25	31.8
Native other grass (if relevant)						
Native forbs and other species (non-grass)		3	3	5	10	4.2
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	67	50	70	30	60	55.4
Rock						
Bare ground	3	10	5	20	5	8.6
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	Cleared	-	-	-
Survey result	Derived Grassland	-	-	-
Agree with mapped RE? If **no**, provide justification from field data	No. Previously mapped as cleared but shows evidence of being derived grassland. Not pasture improved.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**0**	**No. of logs (>10cm)**	**0**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**0**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered☑	Common	Abundant
Potential for **fleshy fruiting plants**	Absent☑	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant☑
Dense shrub/grass shelter	Absent☑	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent☑	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent☑	Scattered	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered☑	Common	Abundant
Coarse woody debris	Absent☑	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent☑	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent☑	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent☑	Scattered	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance.** ☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Plains present.** ☑
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**No.** ☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**No.** ☒
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☒	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Potential for ground dwelling reptiles such as *Tiliqua rugosa*.
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	Ground dwelling reptiles.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes☑ / No Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

Cleared for pasture. The ground cover diversity was quite low due to seasonal constraints (winter).

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T15	**Date:**	23/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0282344
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013987
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☒ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#584		#	
East	#585		#	
South	#586		#	
West	#587		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified☑	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S☑	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale☑	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’☑	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing☑	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate☑	Poor	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Evidence of wood being harvested with chainsaw cross cuts.											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑	T2	S1	S2	G							
Avg height (m) of EDL	10	**Avg DBH (cm) of EDL**	12									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense) ☑	10-30% (sparse)	<10% (very sparse)	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse☑	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below☑	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia tomentosa	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	E		Start Easting		0282320		End Easting		0282367			
			Start Northing		7013979		End Northing		7013994			
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)	12	14	7	11			3	7	1	3	0.1	1
Canopy cover (%)	5		40				8		7			

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Allocasuarina luehmannii		39		29	9		1	
Callitris glaucophylla		44		29	14		1	
Eucalyptus populnea		*1*	1					
Eucalyptus crebra		*4*		2			2	
Pimelea neo-anglica		*1*					1	
Acacia loroloba		*10*					10	
Santalum lanceolatum		*1*		1				
Cassinia laevis								
Geijera parviflora								
Digitaria sp.								
Aristida caput-medusae								
Nyssanthes sp.								
Cheilanthes sieberi								
Eragrostis sp.								
Fimbristylis dichotoma								
Glycine sp.								
Cyanthillium cinereum								
Cyperus sp.								
Lomandra sp.								
Diplachne fusca								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	588	589	590	591	592	
Native perennial grass	35	5	15	15	15	17
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	5			15	7
Native shrubs (<1m)						
Non-native grass			10			2
Non-native forbs and shrubs						
Litter	40	60	40	60	40	48
Rock	15	5				4
Bare ground		10	25	15	15	13
Cryptogams		10	10	10	15	9
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1 Regrowth	-	Least Concern	No Concern at Present
Survey result	11.5.1 Regrowth		Least Concern	No Concern at Present
Agree with mapped RE? If **no**, provide justification from field data	Yes.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**8.5**	**No. of logs (>10cm)**	**4**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**170**	**Per hectare (x 20)**	**80**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent		Present☑	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered☑	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered☑	Common	Abundant
Dense shrub/grass shelter	Absent☑	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered☑	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered☑	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common☑	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common☑	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common☑	Abundant
Coarse woody debris	Absent	Scattered	Common☑	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent	Scattered☑	Common	Abundant
Trees with shedding bark	Absent☑	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered☑	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered☑	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance.**☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Absent.**☒
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Absent.**☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Absent.**☒
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☒	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: **Animal tracks** **Feed scars** **Scratches** **Diggings** **Scats** **Casts** **Bones** **Feathers** **Other**

Breeding places: **Nests** **Burrows** **Shelters** **Drays** **Bowers** **Other**

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Bird nests and sparse koala feed trees.
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	Koala feed trees and bird nests.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

Dense *Allocasuarina luehmannii* between exposed low ridge of rock (1-2m of elevation south to north). Disturbed from logging of canopy trees. 1 large, dead ironbark adjacent to site.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T16	**Date:**	23/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	0282944
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013306
☒ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

	Photos from centre of ESU		Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#605		#	
East	#606		#	
South	#607		#	
West	#608		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly☑	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil☑
Soil Colour	White	Yellow	Orange	Brown	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’☑	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing☑	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%☑	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor☑	Degraded							
Fire scars	Absent	Scattered☑	Frequent	**Time since**	Recent☑	Old	**Average Height (m)**	0.2				
Disturbance notes	Fire scorches on fallen/felled stumps. Likely from when the wood piles were burned post clearing.											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL** ☑	**IMP**	**LKE**	**RIP**	**SHR** ☑	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1☑		S2		G			
Avg height (m) of EDL	2.5				**Avg DBH (cm) of EDL**		5					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse) ☑		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse☑		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below☑	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia stricta	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	N	Start Easting	0282961			End Easting	0282936					
		Start Northing	7013288			End Northing	7013326					
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)									1	4	0.1	1
Canopy cover (%)									10			

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	609	610	611	612	613	
Native perennial grass	22	45	45	35	47	38.8
Native other grass (if relevant)						
Native forbs and other species (non-grass)	3		5		5	2.6
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs		15	5	15	3	7.6
Litter	70	40	20	45	42	43.4
Rock						
Bare ground	5		25	5	3	7.6
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	Cleared	-	-	-
Survey result	Undiff. Regrowth	-	-	-
Agree with mapped RE? If **no**, provide justification from field data	No. Recently cleared; however, a layer of Acacia and Eucalypt regrowth is present.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**7**	**No. of logs (>10cm)**	**3**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**140**	**Per hectare (x 20)**	**60**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered☑	Common	Abundant
Potential for **fleshy fruiting plants**	Absent☑	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent	Scattered☑	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent☑	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent☑	Scattered	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered☑	Common	Abundant
Coarse woody debris	Absent	Scattered☑	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common☑	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered☑	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered☑	Common	Abundant
Mistletoe/Epiphytes	Absent☑	Scattered	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance.**☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Absent.**☒
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Absent.**☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Absent.**☒
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☒	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Potential for bird nests
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	Low risk SMP for potential need to tamper with breeding places.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

Shrubby undifferentiated regrowth. Acacia's dominant.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Taylors-T17	**Date:**	23/08/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒ Well pad	☐ Gas Processing Facility	**Easting (E)**	0282994
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013341
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#616		#	
East	#617		#	
South	#618		#	
West	#619		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly☑	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil☑
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale☑	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing☑	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor☑	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑	T2	S1	S2	G							
Avg height (m) of EDL	16	**Avg DBH (cm) of EDL**	30									
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)☑	n/a							
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse☑	Absent							

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below	Not Found On Site☑

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	N	Start Easting	0283008			End Easting	0282984						
		Start Northing	7013318			End Northing	7013364						
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)			15	18	10	15	4	10	1	3	0.1	1	
Canopy cover (%)		8		15		10		5					

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Angophora leiocarpa		*2*		1		1		
Callitris glaucophylla		*19*			2	17		
Allocasuarina luehmannii		*28*			2	26		
Acacia leiocalyx		*1*					1	
Acacia loroloba		*11*					11	
Petalostigma pubescens		*1*				1		
Corymbia tessellaris		*1*			1			
Cheilanthes sieberi								
Aristida caput-medusae								
Solanum parvifolium								
Lomandra sp.								
Cymbopogon refractus								
Aristida sp.								
Cyanthillium cinereum								
Sida sp.								
Dianella sp.								
Calotis cuneifolia								
Lomandra sp. 2								
Brachyscome sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	620	621	622	623	624	
Native perennial grass	20	10	30	15	10	17
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	10	20	10	5	11
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	50	60	10	75	25	44
Rock						
Bare ground	20	30	30		60	28
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	Cleared	-	-	-
Survey result	11.7.4 Regrowth	-	Least Concern	No Concern at Present
Agree with mapped RE? If **no**, provide justification from field data	No. Partially cleared edge of remnant vegetation.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**30**	**No. of logs (>10cm)**	**4**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**600**	**Per hectare (x 20)**	**80**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent☑	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent	Scattered☑	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered☑	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered☑	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered☑	Common	Abundant
Coarse woody debris	Absent	Scattered☑	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered☑	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered☑	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered☑	Common	Abundant
Mistletoe/Epiphytes	Absent☑	Scattered	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance.**☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Absent.**☒
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Absent.**☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Absent.**☒
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☒	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Breeding places potentially present (nests, etc).
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	Breeding places potentially present (nests, etc).
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

Thinned and regrowth adjacent to remnant 11.7.4.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Doobette-T1	**Date:**	03/09/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0283137
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014386
☐ Monitoring	☒ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☒ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#0014		#	
East	#0015		#	
South	#0016		#	
West	#0017		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain☑
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)									
Slope	Level (<1%)	Gently sloping (1-4%)☑	Moderately sloping (5-10%)	Strongly sloping (11-24%)					
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)					
Aspect	N	S	E	W☑	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale☑	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’	‘Clayey sand’	‘Sandy loam’☑	**‘Loam’**	**‘Silty loam’**			
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**			
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)					
Erosion	Absent☑	Scattered	Frequent						
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance☑						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good☑	Moderate	Poor	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Edge effects in from adjacent fence line/clearing.											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑		T2		S1		S2		G			
Avg height (m) of EDL	18				**Avg DBH (cm) of EDL**		35					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse) ☑		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse☑		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below☑	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia stricta	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	SE	Start Easting		0283121		End Easting		0283162					
		Start Northing		7014393		End Northing		7014386					
Stratum	E	T1		T2		T3		S1		S2/Seedlings			
Height range (m)			18	20	8	15	3	8	1	3	0.1	1	
Canopy cover (%)		20		20		20		10					

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Angophora leiocarpa		*3*		3				
Corymbia sp. (bloodwood)		*1*		1				
Eucalyptus crebra		*1*			1			
Callitris glaucophylla		*11*		1	10			
Allocasuarina luehmannii		*46*		3	7	9	27	
Petalostigma pubescens		*1*				1		
Amyema miquellii		*1*		1				
Acacia leiocalyx		*1*				1		
Acacia crassa		*3*				2	1	
Alphitonia excelsa		*1*					1	
Acacia conferta		*7*				1	6	
Aristida sp.								
Brachyscome multifida								
Lepidosperma laterale								
Eragrostis sp.								
Aristida sp. 2								
Lomandra longifolia								
Lomandra leucocephala								
Digitaria sp.								
Dianella longifolia								
Entolasia sp.								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Walwhalleya sp.								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	0018	0019	0020	0021	0022	
Native perennial grass	30	70	20			24
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10		5	5		4
Native shrubs (<1m)	15			10		5
Non-native grass						
Non-native forbs and shrubs						
Litter	30	30	70	85	85	60
Rock						
Bare ground	15		5		15	7
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.5.1	-	Least Concern	No Concern at Present
Survey result	11.5.1	-	Least Concern	No Concern at Present
Agree with mapped RE? If **no**, provide justification from field data	Yes.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**0**	**Total length of logs (>10cm)**	**33**	**No. of logs (>10cm)**	**12**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**0**	**Per hectare (x 20)**	**660**	**Per hectare (x 20)**	**240**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered☑	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent	Scattered☑	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common☑	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered☑	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers☑	Deep layers
Leaf litter coverage	Absent	Scattered	Common☑	Abundant
Coarse woody debris	Absent	Scattered	Common☑	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered☑	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common☑	Abundant
Mistletoe/Epiphytes	Absent	Scattered☑	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant groud disturbance.**☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Absent.**☒
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Absent.**☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Absent.**☒
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☒	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: **Animal tracks** **Feed scars** **Scratches** **Diggings** **Scats** **Casts** **Bones** **Feathers** **Other**

Breeding places: **Nests** **Burrows** **Shelters** **Drays** **Bowers** **Other**

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

Angophora leiocarpa dominant in a very shallow undulation in the landscape. Relatively undisturbed with good recruitment. Ground layer somewhat diverse.

North

East

South

West

Ecological Field Survey ORG-ARW-HSM-FOR-00067

SITE IDENTIFICATION			
Site Name:	Doobette-T2	**Date:**	03/09/2024
Tenure:	PL493	**Assessor(s):**	Daniel Kelly

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	0283675
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013393
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or 56☑
☒ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	#0035		#	
East	#0036		#	
South	#0037		#	
West	#0038		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain☑
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)☑	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil☑
Soil Colour	White	Yellow	Orange	Brown☑	Red				
	Black	Grey	Pale☑	Dark	Mottled				
Soil (‘field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	‘Sand’	‘Loamy sand’☑	‘Clayey sand’	‘Sandy loam’	**‘Loam’**	**‘Silty loam’**		
	‘Sandy clay loam’	**‘Clay loam’**	**‘Clay loam sandy’**	**‘Silty clay loam’**	**‘Light clay’**	**‘Light medium clay’**		
	‘Medium clay’	**‘Medium heavy clay’**	**‘Heavy clay’**	(Saline mud)				
Erosion	Absent☑	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	Grazing☑	Forestry	Cropping	Conservation	Mining	Other:						
Evidence	Clearing☑	Cultivation	Regrowth☑	Logging☑	Thinning	No disturbance						
Dieback	0%	1-25%☑	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor☑	Degraded							
Fire scars	Absent☑	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes	Callitris/Allocasuarina in T2 largely missing. Shrubby *Acacia* sp. regrowth present.											

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL** ☑	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1☑		T2		S1		S2		G			
Avg height (m) of EDL	16				**Avg DBH (cm) of EDL**		25					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse) ☑		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site☑
Weed infestations	Found on Site – records below☑	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)													
Transect Start compass bearing	S	Start Easting	0283660			End Easting	0283692						
		Start Northing	7013409			End Northing	7013374						
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)			15	20	8	15	3	8	1	3	0.1	1
Canopy cover (%)		20		20		15		5			

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra		*5*		4	1			
Callitris glaucophylla		*18*			15	3		
Allocasuarina luehmannii		*1*				1		
Corymbia sp. (bloodwood)		*2*		1		1		
Acacia crassa		*39*			1	22	1	15
Acacia burrowii		*3*						3
Alphitonia excelsa		*1*						1
Geijera parviflora		*1*						1
Digitaria breviglumis								
Brachyscome multifida								
Cyanthillium cinereum								
Setaria sp. (syn. *Paspalidium*)								
Entolasia sp.								
Solanum nemophilum								
Ancistrachne uncinulata								
Solanum parvifolium								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	**1**	**2**	**3**	**4**	**5**	**Mean**
Photo #	0039	0040	0041	0042	0043	
Native perennial grass	25		55	20	40	28
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10		15	30	5	12
Native shrubs (<1m)				5		1
Non-native grass						
Non-native forbs and shrubs						
Litter	55	50	20	35	40	40
Rock						
Bare ground	10	50	10	10	15	19
Cryptogams						
Total	**=100%**	**=100%**	**=100%**	**=100%**	**=100%**	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	**EPBC Status**	**VM Act Status**	**Biodiversity Status**
Mapped RE	11.7.4	-	Least Concern	No Concern at Present
Survey result	11.7.4	-	Least Concern	No Concern at Present
Agree with mapped RE? If **no**, provide justification from field data	Yes.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	**0**	**No. of hollow logs**	**1**	**Total length of logs (>10cm)**	**24**	**No. of logs (>10cm)**	**11**
Per hectare (x 20)	**0**	**Per hectare (x 20)**	**20**	**Per hectare (x 20)**	**480**	**Per hectare (x 20)**	**220**

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	**Status**			
Cliffs / outcrops	Absent☑		Present	
Wetland / Swamp / Waterbody	Absent☑		Present	
Waterway	Absent☑		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common☑	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered☑	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common☑	Abundant
Dense shrub/grass shelter	Absent	Scattered☑	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered☑	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered☑	Common	Abundant
Large rocks (>30cm)	Absent☑	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent☑	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer☑	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common☑	Abundant
Coarse woody debris	Absent	Scattered	Common☑	Abundant
Termite mounds (>50cm)	Absent☑	Scattered	Common	Abundant
Rock piles	Absent☑	Scattered	Common	Abundant
Trees with shedding bark	Absent☑	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent☑	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered☑	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered☑	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	**No. of trees with hollows (>30cm)**	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	**No significant ground disturbance.**☑	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	**Absent.**☒
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	**Absent.**☒	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	**Absent.**☒
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☒	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Nil	Nil	Nil	Nil	Nil	nil

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	Yes☑	No	Trees with potential nests.
Ecologist	Yes	No☑	
Species Management Plan	Yes☑	No	Trees with potential nests.
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / No☑ Yes☑ / No Yes / No☑ Yes☑ / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No☑	
Notes			

T2 disturbed. Some old, large Eucalyptus crebra remain. 35m wide strip of vegetation between fence line and pasture.

North

East

South

West

TR1

targetzero

SITE IDENTIFICATION			
Site Name:	Wyalla - T18	**Date:**	03.09.2024
Tenure:	PL493	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	283519
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013974
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 8086		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	(NE)	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)		(Forestry)		Cropping		Conservation		(Mining)		Other:	
Evidence	Clearing		Cultivation		(Regrowth)		(Logging)		Thinning		No disturbance	
Dieback	0%		(1-25%)		26-75%				>76%			n/a
Site condition	Very good		(Good)		Moderate				Poor			Degraded
Fire scars	(Absent)	Scattered		Frequent	**Time since**		Recent		Old		**Average Height (m)**	
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**(WDL)**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2			S1			S2		G
Avg height (m) of EDL	12					**Avg DBH (cm) of EDL**			24			
Canopy cover (%) of EDL	>70% (dense/closed)			(30-70% (mid-dense))			10-30% (sparse)			<10% (very sparse)		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			(Very sparse)		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Opuntia stricta	Low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NE	Start Easting	283493	End Easting	283543
		Start Northing	7013970	End Northing	7013971

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		12 | 16	6 | 12	2 | 6	1 | 2	0.1 | 0.9
Canopy cover (%)		25	15	5	5	5

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
F. arebra		8		6	2			
Callitris glaucophylla		50		15	13	17	5	
Acacia leiocalyx		64				5	37	22
Acacia cretata		2						2
Alphitonia excelsa								
Solanum spp								
Enteleasia fuscata								
Aristida caput-medusae								
Panicum decompositum								
Chamia aspera								
Dianella caerulea								
Hibbertia dichotoma								
Cheilanthes sieberi								
Brachyscome spp.								

S2

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	8081	→	→	→	→	
Native perennial grass	10	15	15	20	15	
Native other grass (if relevant)						
Native forbs and other species (non-grass)		15		15		
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	70	60	60	40	60	
Rock						
Bare ground	20	10	25	25	25	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.7.4	NA	LC	NC
Survey result	11.7.4	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	1	Total length of logs (>10cm)	13	No. of logs (>10cm)	5
Per hectare (x 20)	0	Per hectare (x 20)	20	Per hectare (x 20)	130	Per hectare (x 20)	100

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	(Absent)		Present	
Wetland / Swamp / Waterbody	(Absent)		Present	
Waterway	(Absent)		Present	
Potential for nectar / pollen	Absent	(Scattered)	Common	Abundant
Potential for fleshy fruiting plants	Absent	(Scattered)	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	(Common)	Abundant
Dense shrub/grass shelter	Absent	Scattered	(Common)	Abundant
Large Eucalypts (>30cm DBH)	Absent	(Scattered)	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	(Scattered)	Common	Abundant
Large rocks (>30cm)	(Absent)	Scattered	Common	Abundant
Small rocks (10-30cm)	(Absent)	Scattered	Common	Abundant
Leaf litter depth	Absent	(Single layer)	Multiple layers	Deep layers
Leaf litter coverage	Absent	(Scattered)	Common	Abundant
Coarse woody debris	Absent	(Scattered)	Common	Abundant
Termite mounds (>50cm)	(Absent)	Scattered	Common	Abundant
Rock piles	(Absent)	Scattered	Common	Abundant
Trees with shedding bark	Absent	(Scattered)	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	(Absent)	Scattered	Common	Abundant
Koala feed trees	Absent	(Scattered)	Common	Abundant
Mistletoe/Epiphytes	(Absent)	Scattered	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	NO	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	plains
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	NO soil cracks	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	NO
Grey snake habitat PRESENT ☐		**Grey snake habitat ABSENT** ☑	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Hollow logs					

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If **required**, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

TR 2

targetzero

SITE IDENTIFICATION			
Site Name:	Wyalla - T19	**Date:**	03.09.2021
Tenure:	PL 493	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	283969
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014047
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 6105		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	(S)	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other:	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%	26-75%	>76%	n/a		
Site condition	Very good	Good	Moderate	Poor	Degraded		
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1		T2		S1		S2		G			
Avg height (m) of EDL	15				**Avg DBH (cm) of EDL**		28					
Canopy cover (%) of EDL	>70% (dense/closed)		30-70% (mid-dense)		10-30% (sparse)		<10% (very sparse)		n/a			
Functional shrub layer density (<2m)	Dense/closed		Mid-dense		Sparse		Very sparse		Absent			

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**
Syzygium tomentosa	low				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)												
Transect Start compass bearing	S	Start Easting	283972			End Easting	283966					
		Start Northing	7014070			End Northing	7014019					
Stratum	E		T1		T2		T3		S1		S2/Seedlings	
Height range (m)			12	18	6	12	2	6	1	2	0.1	0.9
Canopy cover (%)			25		15		10		5		5	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
F. crebra		8		6	1	1		
F. fibrosa		19		14	3	2		
Callitris glaucophylla		14		–	7	5		
Allocasuarina luehmannii		2				2		
Acacia leiocalyx		51				8	32	11
Acacia cultriformis		15						15
Prostanthera cryptandroides								
Entolasia stricta								
Ghania aspera								
Fimbristylis dichotoma								
Brachyscome spp.								
Cheilanthes sieberi								
Solanum spp.								

S2

Ecological Field Survey [illegible]

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	8100	→	→	→	→	
Native perennial grass	20	25	16	5	15	
Native other grass (if relevant)						
Native forbs and other species (non-grass)						
Native shrubs (<1m)	15			5		
Non-native grass						
Non-native forbs and shrubs						
Litter	40	45	60	70	60	
Rock						
Bare ground	25	30	30	20	25	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (3D)	11.5.1	NA	LC	NC
Survey result	11.5.1	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	13	No. of logs (>10cm)	5
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	260	Per hectare (x 20)	900

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for **nectar / pollen**	Absent	Scattered	Common	Abundant
Potential for **fleshy fruiting plants**	Absent	Scattered	Common	Abundant
Potential for **seeding grass cover**	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Coarse woody debris	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	NO	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	plains
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	NO Soil cracks	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	NO
Grey snake habitat PRESENT ☐		Grey snake habitat ABSENT ☐	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of the transect

East face of the transect

South face of the transect

West face of the transect

targetzero

SITE IDENTIFICATION			
Site Name:	Wyalla-T20	**Date:**	03.09.2024
Tenure:	PL493	**Assessor(s):**	Nasim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	284480
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7014138
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 8114		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	(NW)	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	(Sandy loam)	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent		Scattered		Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	(Mining)	Other:						
Evidence	(Clearing)	Cultivation	(Regrowth)	Logging	(Thinning)	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	(n/a)							
Site condition	Very good	Good	Moderate	(Poor)	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**(GRL)**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	(T1)			T2			S1			S2		G
Avg height (m) of EDL	8					**Avg DBH (cm) of EDL**	39					
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)			10-30% (sparse)			(<10% (very sparse))		n/a
Functional shrub layer density (<2m)	Dense/closed			Mid-dense			Sparse			(Very sparse)		Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	(Found on Site – records below)	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Syzygium forte subsp.	Low				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

VEGETATION FLORISTICS (record all species within 50m x 10m transect)											
Transect Start compass bearing	NW	Start Easting	284486		End Easting	284473					
		Start Northing	7014114		End Northing	7014161					
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		12	18					1	2	0.1	0.9
Canopy cover (%)		10						3		2	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
E. floresa		15		7			5	3
E. crebra		1		1				
Acacia cofcrta		2						2
Acacia leiocalyx		4						4
Aristida ramosa								
Aristida caput-medusae								
Cenchrus ciliaris								
Diaella spp.								
Grahnia aspera								
Enfolasia stricta								
Glandularia aristigera								
Melinis ripens								

S2

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	8109	→	→	→	→	
Native perennial grass		10	5	10	5	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10		5		5	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	20	60	60	50	10	
Rock	30	10	10		20	
Bare ground	40	20	20	40	60	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (Govt.)	Non-rem	N/A	N/A	N/A
Survey result	Undiff. Regrowth			
Agree with mapped RE? If no, provide justification from field data	YES, but it is undifferentiated Regrowth.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	X	No. of logs (>10cm)	X
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	X

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Coarse woody debris	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	No. of trees with hollows (>30cm)	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks)	NO	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	plains
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	No soil crack	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	NO
Grey snake habitat PRESENT ☐		Grey snake habitat ABSENT ☐	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other

Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

This is grey box fw spacing, but found very few Eucalyptus inside the scouted area. This is shrubby zone mainly.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	Wyalla - T21	**Date:**	03.09.2024
Tenure:	PL493	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☐ Well pad	☐ Gas Processing Facility	**Easting (E)**	284127
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013479
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 8135		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	(SE)	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red				
	Black	Grey	Pale	Dark	Mottled				
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'			
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'			
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)					
Erosion		(Absent)		Scattered			Frequent		
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank			

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Land use	(Grazing)	Forestry	Cropping	Conservation	(Mining)	Other:						
Evidence	(Clearing)	Cultivation	(Regrowth)	Logging	(Thinning)	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	(n/a)							
Site condition	Very good	Good	Moderate	(Poor)	Degraded							
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	(S1)	S2	G
Avg height (m) of EDL	1.0		**Avg DBH (cm) of EDL**	6.0	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	(10-30% (sparse))	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	(Very sparse)	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; If confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)						
Transect Start compass bearing	SE	Start Easting	284118	End Easting	284142	
		Start Northing	7013503	End Northing	7013458	
Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)					1 2	01 09
Canopy cover (%)					10	5

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Acacia conferta							13	19
Acacia leiocalyx							10	7
Acacia laroloba							4	3
Alphitonia excelsa								2
E fibrosa							1	1
Archontophoenix cunninghamiana								
Chamaedorea aspera								
Brachychiton spp.								
Dianella caerulea								
Melaleuca viridiflora								
Solanum spp.								
Cenchrus ciliaris								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	8130	→	→	→	→	
Native perennial grass	20	15	20	30	30	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	20	25	15		15	
Native shrubs (<1m)			15			
Non-native grass						
Non-native forbs and shrubs	5	5	5			
Litter	30	40	35	40	30	
Rock						
Bare ground	25	15	20	30	25	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (Govt.)	Non-rem	N/A	N/A	NA
Survey result	Undiff. Regrowth	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES, but it is a regrowth area dominated by Acacia spp.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	X	No. of hollow logs	X	Total length of logs (>10cm)	X	No. of logs (>10cm)	X
Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	X	Per hectare (x 20)	X

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Coarse woody debris	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	x	No. of trees with hollows (>30cm)	x

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	NO	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	plains
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	No soil crack	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	NO
Grey snake habitat PRESENT ☐		Grey snake habitat ABSENT ☑	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	vegetation clearing
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

A big area is under regrowth zone. There is no 3D mapping. specially grading area.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	Wylla-T22	**Date:**	03.09.2024
Tenure:	PL 493	**Assessor(s):**	Nazim Uddin

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	**Easting (E)**	284842
☐ Pilot Well + Dam	☐ Dam	**Northing (N)**	7013222
☐ Monitoring	☐ Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐ Roads & Tracks	☐ Seismic Line	**Other description**	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	**Notes**	**Number**	**Notes**
North	# 8448		#	
East	#		#	
South	#		#	
West	#		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	(White)	Yellow	Orange	Brown	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	(Sandy loam)	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	(Absent)	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	(Grazing)	Forestry	Cropping	Conservation	(Mining)	Other:	
Evidence	(Clearing)	Cultivation	(Regrowth)	(Logging)	Thinning	No disturbance	
Dieback	0%	1-25%	26-75%	>76%	(n/a)		
Site condition	Very good	Good	Moderate	(Poor)	Degraded		
Fire scars	(Absent)	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)												
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	(S1)	S2	G
Avg height (m) of EDL	12		**Avg DBH (cm) of EDL**	7	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	(10-30% (sparse))	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	(Sparse)	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	(Not Found On Site)
Weed infestations	Found on Site – records below	(Not Found On Site)

Threatened Flora and Weeds (declared and locally significant) (Locations across ESU)					
Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	E	Start Easting	284819	End Easting	284868
		Start Northing	7013215	End Northing	7013229

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)					1 2	0.1 0.9
Canopy cover (%)					10	10

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Ferraria		4					3	1
Acacia leiocalyx		33					12	21
Acacia ixiophylla		18					3	15
Acacia cochlearis		19					6	13
Dodonaea triangularis		2						2
Prostanthera cryptandroides								
Aristida caput-medusae								
Glandularia aristigera								
Panicum decompositum								
Fimbristylis dichotoma								
Brachyscome spp.								
Entolasia stricta								
Senecio spp.								
Solanum esuriale								

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	8143	→				
Native perennial grass	10	10	20	10	15	
Native other grass (if relevant)						
Native forbs and other species (non-grass)	10	20	30	40	10	
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs	10	5		10	5	
Litter	40	20	20	20	40	
Rock						
Bare ground	30	45	30	20	30	
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE (Govt.)	Non-Rem	NA	NA	NA
Survey result	Undif. Regrowth	"	"	"
Agree with mapped RE? If no, provide justification from field data	YES, but it is Undif. Regrowth.			

FAUNA HABITAT within 50m x 10m transect							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	7	No. of logs (>10cm)	3
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	140	Per hectare (x 20)	60

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Coarse woody debris	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks (>5mm wide & >50mm deep)	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

GREATER GLIDER habitat within a 1 hectare area (ONLY to be completed in REs 11.7.6 and 11.7.7)			
No. of trees with hollows (>50cm)	X	No. of trees with hollows (>30cm)	X

GREY SNAKE habitat suitability analysis			
LAND USE / Significant Ground Disturbance No significant ground disturbance (defined as areas with frequent surface disturbance, e.g. cropping, cultivation, roads/tracks).	NO	**LANDFORM / Plains / Streams / Water** Presence of suitable landforms.	plains
PHYSIOGRAPHY / Soil Presence of cracking clay soils (Vertosols), within 50 m of freshwater wetlands, drainage features likely to hold water for protracted periods (i.e. 4-6 weeks) or gilgai microrelief.	NO	**PHYSIOGRAPHY / Fauna Habitat** Presence of non-cracking clay soils, with habitat providing suitable shelter (e.g. leaf litter, coarse woody debris) within 50 m of freshwater wetlands, drainage features or gilgai microrelief.	NO
Grey snake habitat PRESENT ☐		Grey snake habitat ABSENT ☐	

FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander)

N.B. GPS all potential breeding places but not necessarily all fauna signs.

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Drays Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Vegetation clearing.
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

Regrowth Area.

North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey OPS-ENV-HSM-FOR-0006 /

targetzero
► zero incidents ► zero injuries

Site Name:	Woodland 5 (WD 5)	**Date:**	19/1/22
Tenure:	Parker	**Assessor(s):**	Sasha Dryden

Development Type				**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☒	Well pad	☐	Gas Processing Facility	**Easting (E)**	0279428
☐	Pilot Well + Dam	☐	Dam	**Northing (N)**	7012264
☐	Monitoring	☐	Pipeline	**Datum**	GDA94, MGA zone: 55 or (56)
☐	Roads & Tracks	☐	Seismic Line	**Other description**	
☐	Work over	☐	Property (area) wide		

	Number	**Notes**	**Number**	**Notes**
North	# 781		#	
East	# 782		#	
South	# 783		#	
West	# 784		#	

Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	(Unspecified, flat, gentle, slopes, undulating terrain)
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill			Inland dune, inland sand hill
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash			Inland channel country, stream distributary system, intermittently flooded
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole		Saltwater, sea, swamp

Slope	Level (<1%)	(Gently sloping (1-4%))	Moderately sloping (5-10%)	Strongly sloping (11-24%)	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)
Aspect	N	S	(E)	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	(Brown)	Red	Black	Grey	Pale	Dark	Mottled
Soil (*field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content*)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	'Sandy clay loam'	'Clay loam'	(Clay loam sandy)	'Silty clay loam'	'Light clay'	'Light medium clay'	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)		
Erosion		(Absent)	Scattered	Frequent				
Erosion Type	Tunnelling	(Sheet)	Rill	Gully	Mass failure	Stream-bank		

Ecological Field Survey

targetzero
► zero incidents ► zero injuries

Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: DASOME ?						
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance						
Dieback	0%	1-25%	26-75%	>76%	n/a							
Site condition	Very good	Good	Moderate	Poor	Degraded							
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**					
Disturbance notes												

Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**

Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	22		**Avg DBH (cm) of EDL**	25 cm	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Species	**Density***	**Waypoint/Polygon**	**Easting**	**Northing**	**Photo number**

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey

targetzero

Transect Start compass bearing	100°	Start Easting	56	0279450		End Easting	56	0279403			
		Start Northing		7012066		End Northing		7012065			
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		18	25	12	16			1	3	0	1
Canopy cover (%)		60%		16%				—		—	

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus decorticans				IIII I	IIII III		I	
Eucalyptus crebra				IIII II	I			
Lysicarpus angustifolius					I			
Allocasuarina diophloia								
Entolasia stricta								
Chellanthes aspera								
Eragrostis sp.								
Acacia leiocalyx subsp leiocalyx					I			IIII
Solanum parvifolium								
Solanum [illegible]								IIII IIII III
Goodenia glabra								

Ecological Field Survey

targetzero
▶ zero incidents ▶ zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

Photo #	785	786	787	788	789	
Native perennial grass	80	50	90	95	90	81
Native other grass (if relevant)						
Native forbs and other species (non-grass)	5		10			3
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	15	50		5	10	16
Rock						
Bare ground						
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

11.7.5	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE 11.7.4/11.7.7	~~Non-remnant~~	—	LC	NC
Survey result	11.7.4	—	LC	NC
Agree with mapped RE? If no, provide justification from field data	Yes			

No. Of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	17	No. of logs (>10cm)	6
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	340	Per hectare (x 20)	120

Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
scats	macropod				
diggings	unknown.				

	Required?		If required, why?
Fauna spotter/catcher	Yes	(No)	
Ecologist	Yes	(No)	
Species Management Plan	(Yes)	No	Low risk SMP for least concern species
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / (No)		Is the vegetation suitable for slashing only?
	(Yes) / No		Is the slope < 5%?
	(Yes) / No		Is the clay content > 20%?
	(Yes) / No		Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			

North face of transect

East face of the transect

South face of the transect

West face of the transect

SITE IDENTIFICATION			
Site Name:	~~#: 7-4-1~~ 11-5-1-1	Date:	23/03/2022
Tenure:	PL493	Assessor(s):	Melanie Ashmore

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	1662 281686
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7012 815
☐ Monitoring	☐ Pipeline	Datum	GDA94, MGA zone: 55 or (56)
☑ Roads & Tracks	☐ Seismic Line	Other description	
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# 220		#	
East	# ↓		#	
South	# ↓		#	
West	# 223		#	

LANDFORM estimated within 500m (broad assessment – view of the area; circle the most characteristic feature, one only)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill	Inland dune, inland sand hill		
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash	Inland channel country, stream distributary system, intermittently flooded		
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY estimated within ESU or 100m x 100m area (broad assessment – random meander)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

targetzero
► ate rodents ► ate mites

DISTURBANCE estimated within ESU or 100m x 100m area (broad assessment – random meander)							
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: Road reserve	
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance	
Dieback	0%	1-25%	26-75%	>76%	n/a Mostly in T2		
Site condition	Very good	Good	Moderate	Poor	Degraded		
Fire scars	Absent	Scattered	Frequent	**Time since**	Recent	Old	**Average Height (m)**
Disturbance notes							

VEGETATION STRUCTURE and CONTEXT estimated within ESU or 100m x 100m area (broad assessment – random meander)											
Macrohabitat(s) present	**CEST**	**Rf**	**H**	**FOR**	**WDL**	**GRL**	**IMP**	**LKE**	**RIP**	**SHR**	**SW**	**DIS**
Key: **CEST**-Coastal & estuarine; **Rf**-Rainforest (including SEVT); **H**-Heath; **FOR**-Forest; **WDL**-Woodland; **GRL**-Grassland; **IMP**-Improved pasture; **LKE**-Lake/dam; **RIP**-Riparian; **SHR**-Shrubland; **SW**-Swamp/Wetland; **DIS**-Disturbed areas (e.g. roadsides, cropping land, urban areas).											

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	12		**Avg DBH (cm) of EDL**	35	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

Threatened Flora and Weeds (declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (declared and locally significant)
(Locations across ESU)

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	Scattered	throughout	road corridor		

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

targetzero

VEGETATION FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	N	Start Easting	661 281677	End Easting	661 281688
		Start Northing	7012794	End Northing	7012938

Stratum	E	T1	T2	T3	S1	S2/Seedlings
Height range (m)		10 | 15	5 | ~~8~~ 7		2 | 3	0 | ~~[illegible]~~ 1
Canopy cover (%)		25	~~45~~ 70		5	1

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Cymbopogon refractus								
* Bidens pilosa								
Eragrostis leptostachya								
Aristida adscensionis								
Cheilanthes sieberi								
Sporobolus (linear, gaps)	Sporobolus creber							
Weeping bamboo	Arundinella nepalensis							
Lomandra filiformis								
* Glandularia aristigera								
Calotis cuneifolia								
Oxalis radicosa								
Enneapogon dichotoma								
Siegesbeckia orientalis								
Panicum effusum								
Hakea gibbosa								
Acacia leiocalyx		6			(1)		(1) (2) (3)	IIII (4)
~~Eucalyptus~~ Eucalyptus chloroclada		6		II (2)			III (3)	(1)
* Opuntia tomentosa		1						(1)
Acacia deanei		2					(1)	(1)
Eucalyptus crebra		16		IIII IIII (9)	IIII II (7)			
Callitris glaucophylla		10		(1)	IIII III (8)			

Ecological Field Survey GIS-ARW-HSM-FOR-00057

targetzero

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Brunoniella australis								
Paspalidium distans								
Chloris ventricosa								
Einadia nutans								
Aristida leptopoda								
Solanum ferocissimum								

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	224	→	→	→	228	
Native perennial grass	30	55	75	95	95	70
Native other grass (if relevant)						
Native forbs and other species (non-grass)	30	25	5	5	5	14
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	40	20	20			16
Rock						
Bare ground						
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE 3Decozmart	11.7.7	NA	LC	NCAP
Survey result	11.5.1	"	"	"
Agree with mapped RE? If no, provide justification from field data	No, area is not gravelly/hilly, Land zone 5. Eucalyptus crebra dominant, not fibrosa			

FAUNA HABITAT within 50m x 10m transect								
No. Of trees with hollows (>10cm)	0	No. of hollow logs	11 (2)	Total length of logs (>10cm)	11+24+16+2+14 (37)	No. of logs (>10cm)	11 (12)	
Per hectare (x 20)	0	Per hectare (x 20)	40	Per hectare (x 20)	740	Per hectare (x 20)	240	

FAUNA HABITAT FEATURES estimated within ESU or 100m x 100m (broad assessment – random meander)				
Habitat feature	Status			
Cliffs / outcrops	Absent		Present	
Wetland / Swamp / Waterbody	Absent		Present	
Waterway	Absent		Present	
Potential for nectar / pollen	Absent	Scattered	Common	Abundant
Potential for fleshy fruiting plants	Absent	Scattered	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered	Common	Abundant
Large rocks (>30cm)	Absent	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered	Common	Abundant
Rock piles	Absent	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered	Common	Abundant
Soil cracks	Absent	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common	Abundant
Mistletoe/Epiphytes	Absent	Scattered	Common	Abundant

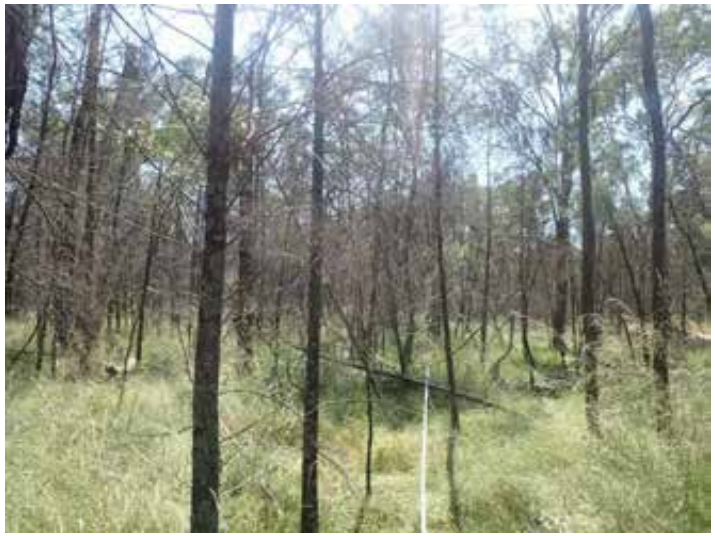
FAUNA SIGNS estimated within ESU or 100m x 100m area (broad assessment – random meander) N.B. GPS all potential breeding places but not necessarily all fauna signs. Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other Breeding places: Nests Burrows Shelters Drays Bowers Other				
Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)	Other Information (e.g. age, collected, active/inactive)
			Easting / Northing	

E	Endangered
V	Vulnerable
NT	Near Threatened
SLC	Special Least Concern
CBS	Colonial Breeding Species

Special Least Concern Species
Echidna, Platypus, Migratory Species

Colonial Breeding Species
Microbats, wetland birds

AC Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	Trees >4m
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: **Suitable – if all 4 questions are yes**	Yes / (No) (Yes) / No (Yes) / No (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	(No)	
Notes			



North face of the transect

East face of the transect

South face of the transect

West face of the transect

Ecological Field Survey ORG-ARW-HSM-FOR-00067

target zero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	JP-10 KoganCk-T19	Date:	31/7/24
Tenure:	twp? 55 Dy 71 Dibbys	Assessor(s):	Josh Prostamo

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	56 J 0277 256
☐ Pilot Well + Dam	☐ Dam	Northing (N)	701 47 18
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	GDA 2020.
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photo of landscape and features	
	Number	Notes	Number	Notes
North	# 1096	107	# 1146	End plot E facing
East	# 1097	108	# 1147	Soil
South	# 1098	109	# 1148	Start plot, N facing.
West	# 1099/10	110	#	

LANDFORM within 500m (aerial assessment – view of the surrounding landscape)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PHYSIOGRAPHY within ESU or 100m x 100m area (slope & aspect – run of water)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil (*Field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: Historic clearing
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance
Dieback	0%	1-25%		26-75%	>76%	n/a
Site condition	Very good	Good		Moderate	Poor	Degraded
Fire scars	Absent	Scattered	Frequent	Time since	Recent	Old	Average Height (m)	
Disturbance notes	Historically cleared. track nearby					

Macrohabitat(s) present	CEST	Rf	H	FOR	WDL	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: CEST-Coastal & estuarine; Rf-Rainforest (including SEVT); H-Heath; FOR-Forest; WDL-Woodland; GRL-Grassland; IMP-Improved pasture; LKE-Lake/dam; RIP-Riparian; SHR-Shrubland; SW-Swamp/Wetland; DIS-Disturbed areas (e.g. roadsides, cropping land, urban areas).												

Ecologically dominant layer (EDL)	T1	T2	S1	S2	G
Avg height (m) of EDL	14		Avg DBH (cm) of EDL	30	
Canopy cover (%) of EDL	>70% (dense/closed)	30-70% (mid-dense)	10-30% (sparse)	<10% (very sparse)	n/a
Functional shrub layer density (<2m)	Dense/closed	Mid-dense	Sparse	Very sparse	Absent

	Found on Site – records below	Not Found On Site
Threatened Flora		
Weed Infestations	Found on Site – records below	Not Found On Site

Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa	V				

* Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; If confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero

VEGETATION FLORISTICS (to count all species within 50m x 10m transect)

Transect Start compass bearing	5	Start Easting	561 0277273			End Easting	561 0277256				
		Start Northing	701 4750			End Northing	701 4705				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		14	18	7	10	4	6	0	2		
Canopy cover (%)		20		30		20		5			

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus crebra				3	4			
Acacia leiocalyx								
Callitris sp.					6			
Acacia conferta								
Angophora leiocarpa				1				
Eucalyptus populnea				1				
Pittosporum angustifolium						1		
Aphania aspera								
Dianella caerulea								
Callotis sp.								
Alphitonia excelsa								
Lomandra longifolia								
wiry grass								
Sida Hackettiana								
Callotis sp								
Dodonea triquetra								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	~~1000~~ 111	~~1000~~ 112	~~1000~~ 113	~~1000~~ 114	~~1000~~ 115	
Native perennial grass	10	15	40	75	50	38
Native other grass (if relevant)						
Native forbs and other species (non-grass)	3	6	12	5	10	7.2
Native shrubs (<1m)	5	5				2
Non-native grass						
Non-native forbs and shrubs						
Litter	72	64	48	20	40	48.8
Rock						
Bare ground	10	10				4
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM MAPPING				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.7.7	LC	LC	NCAP
Survey result	11.5.1	LC	LC	NCAP
Agree with mapped RE? If no, provide justification from field data	no. Soils Deep & uniform. LZ 7 Jump up Starts ~50m East of plot. could just need to adjust mapping Polygons.			

FAUNA HABITAT within 50m x 10m quadrat							
No. of trees with hollows (>10cm)	0	No. of hollow logs	2	Total length of logs (>10cm)	22	No. of logs (>10cm)	5
Per hectare (x 20)	0	Per hectare (x 20)	40	Per hectare (x 20)	440	Per hectare (x 20)	100

HABITAT FEATURES within 50m x 10m quadrat (100m x 100m for cliff, wetland, waterway)				
Habitat feature	Status			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for nectar / pollen	Absent	Scattered	Common ✓	Abundant
Potential for fleshy fruiting plants	Absent	Scattered ✓	Common	Abundant
Potential for seeding grass cover	Absent	Scattered ✓	Common	Abundant
Dense shrub/grass shelter	Absent	Scattered ✓	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered	Common ✓	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent	Scattered ✓	Common	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent ✓	Scattered	Common	Abundant
Soil cracks	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

No. of trees with hollows (>50cm)	0	No. of trees with hollows (>30cm)	0

Fauna signs: Animal tracks Feed scars Scratches Diggings Scats Casts Bones Feathers Other
Breeding places: Nests Burrows Shelters Dreys Bowers Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
lots of litter	general				

E	Endangered	Special Least Concern Species Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	Colonial Breeding Species Microbats, wetland birds
CBS	Colonial Breeding Species	

	Required?		If required, why?
Fauna spotter/catcher	Yes	No	general fauna
Ecologist	Yes	No	
Species Management Plan	Yes	No	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	Yes / No Yes / No Yes / No Yes / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	Yes	No	
Notes			

North face of ESU

East face of ESU

South face of ESU

West face of ESU

Ecological Field Survey ORG-ARW-HSM-FOR-00067

target zero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	JP-11 KoganCk-T19	Date:	31/7/24
Tenure:	52 DY249 TWEP	Assessor(s):	Josh Prostamo

DEVELOPMENT TYPE & LOCATION			
Development Type		**Centre of Ecological Stratification Unit (ESU) or 100m x 100m area**	
☑ Well pad	☐ Gas Processing Facility	Easting (E)	561 0277 046
☐ Pilot Well + Dam	☐ Dam	Northing (N)	701 5781
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	GDAzone
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of landscape and features	
	Number	Notes	Number	Notes
North	# ~~116~~ 117	119	# ~~125~~ 128	End plot facing west
East	# ~~117~~ 118	120	#	
South	# ~~118~~ 119	121	#	
West	# ~~119~~ 120	122	#	

LANDFORM estimated within 100m radius of assessment – circle all that apply (the most dominant should be circled first, one only)

Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, flood plain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

PATTERN/SURFACE estimated within 20m x 100m area (ground assessment – circle all that apply)

Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)			
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)			
Aspect	N	S	E	W	NE	NW	SE	SW (Nil)
Soil Colour	White	Yellow	Orange	Brown	Red			
	Black	(Grey)	(Pale)	Dark	Mottled			
Soil ('Field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'	
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'	
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)			
Erosion		Absent	Scattered	Frequent			
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank	

DISTURBANCE estimated within 50m or 100m x 100m area (broad assessment – circle/tick as relevant)												
Land use	Grazing		Forestry		Cropping		Conservation		Mining		Other: Historical clearing	
Evidence	Clearing		Cultivation		Regrowth		Logging		Thinning		No disturbance	
Dieback	0%		1-25%		26-75%		>76%		n/a			
Site condition	Very good		Good		Moderate		Poor		Degraded			
Fire scars	Absent	Scattered	Frequent	Time since	Recent		Old	Average Height (m)				
Disturbance notes												

VEGETATION STRUCTURE and CONTEXT (estimated within 50m or 100m x 100m area (broad assessment – circle/tick as relevant)												
Macrohabitat(s) present	CEST	Rf	H	FOR	WDL	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: CEST-Coastal & estuarine; Rf-Rainforest (including SEVT); H-Heath; FOR-Forest; WDL-Woodland; GRL-Grassland; IMP-Improved pasture; LKE-Lake/dam; RIP-Riparian; SHR-Shrubland; SW-Swamp/Wetland; DIS-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg height (m) of EDL	12					Avg DBH (cm) of EDL			18			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (Declared and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed Infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (Declared and locally significant) (Duplicate across ESU)					
Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
opuntia tomentosa	V				
Sporobolus sp.*	V				

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; If confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero

VEGETATION / FLORISTICS (record all species within 50m x 10m transect)

Transect Start compass bearing	NJ	Start Easting	56J 0277073			End Easting	56J 0277084				
		Start Northing	701 5764			End Northing	701 5808				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		10	14	5	7			0	2		
Canopy cover (%)		40		30				40			

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus maloccana				12	11			
Acacia leiocalyx							1	
Acacia deani							9	
Psydrax odorata							1	
Gahnia aspera								
Lomandra longifolia								
Aristida caput-medusae								
Aristida ramosa								
Alloteropsis semialata								
Eragrostis sp								
Cyperus sp								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

target zero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 50m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	~~123~~ 123	~~124~~ 124	~~125~~ 125	~~126~~ 126	~~127~~ 127	
Native perennial grass	75	83	80	30	63	~~62.5~~ 66.2
Native other grass (if relevant)						
Native forbs and other species (non-grass)		2				0.4
Native shrubs (<1m)					2	0.4
Non-native grass					20	4
Non-native forbs and shrubs						
Litter	20	15	20	65	15	27
Rock						
Bare ground	5			5		2
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

REGIONAL ECOSYSTEM (RE)				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.5.1	LC	LC	~~EC~~ NCAP
Survey result	11.5.20	LC	LC	NCAP
Agree with mapped RE? If no, provide justification from field data	no. no Crebra present. E. populnea may be present around but few on well pad. Check L2. if 5, it may be 11.5.20			

FAUNA HABITAT within 20m x 20m quadrat							
No. of trees with hollows (>10cm)	0	No. of hollow logs	0	Total length of logs (>10cm)	2	No. of logs (>10cm)	1
Per hectare (x 20)	0	Per hectare (x 20)	0	Per hectare (x 20)	40	Per hectare (x 20)	20

FAUNA HABITAT (Circle one option per row for 20m x 20m quadrat unless otherwise specified)				
Habitat feature	Status			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for nectar / pollen	Absent	Scattered	Common ✓	Abundant
Potential for fleshy fruiting plants	Absent	Scattered ✓	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered	Common ✓	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered ✓	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent ✓	Scattered	Common	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered	Common ✓	Abundant
Termite mounds (>50cm)	Absent ✓	Scattered	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent ✓	Scattered	Common	Abundant
Soil cracks	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER HABITAT within a 2 hectare area (ONLY to be completed in PEA Lot 2 and Lot 3)			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS recorded within plot or 100m x 100m area (Brief assessment – random recording)
N.B. DO not attempt to capture, trap or approach any fauna species
Fauna signs: Animal tracks, Feed trails, Scratches, Diggings, Scats, Carcs, Bones, Feathers, Other
Breeding places: Nests, Burrows, Shelters, Drays, Rookery, Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
Seeding grass	general				

E	Endangered	Special Least Concern Species Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	Colonial Breeding Species Microbats, wetland birds
CBS	Colonial Breeding Species	

BO Recommendations – Site Preparation			
	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	general habitat.
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – if all 4 questions are yes	(Yes) / No (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	(Yes)	No	
Notes			

North face of ESU

East face of ESU

South face of ESU

West face of ESU

Ecological Field Survey ORG-ARW-HSM-FOR-00067

target zero
► zero incidents ► zero injuries

SITE IDENTIFICATION			
Site Name:	JP-12 KoganCk-T21	Date:	31/7/24
Tenure:	55 D471 PWRP Dibleys	Assessor(s):	Josh Prostano

DEVELOPMENT TYPE & LOCATION			
Development Type		Centre of Ecological Stratification Unit (ESU) or 100m x 100m area	
☐ Well pad	☐ Gas Processing Facility	Easting (E)	5603277076
☐ Pilot Well + Dam	☐ Dam	Northing (N)	7014840
☐ Monitoring	☑ Pipeline	Datum	GDA94, MGA zone: 55 or 56
☐ Roads & Tracks	☐ Seismic Line	Other description	GDA 2020
☐ Work over	☐ Property (area) wide		

Photos from centre of ESU			Photos of indicators and hazards	
	Number	Notes	Number	Notes
North	# ~~122~~	129	# ~~139~~ 138	Sol
East	# ~~123~~	130	# ~~139~~ 139	End plot facing W
South	# ~~124~~	131	# ~~140~~ 140	" " " " S
West	# ~~125~~	132	# ~~141~~ 141	Start plot facing north

Land Zone (Choose within 50m of centre of ESU or area assessed – refer to the land zone glossary)					
Plains	Downs – open, rolling, ashy, pebbly	Alluvial plain or flat, floodplain	Inland clay pan, salt flat, salt pan	Coastal tidal flat or salt flat	Unspecified, flat, gentle, slopes, undulating terrain
Hill, Mountain, Tableland	Slope or hill not specified	Cliff, steep rock, rocky ledge, rocky outcrop, scarp, crevice	Coastal rocky headland	Top, crest of mountain or ridge	Jump-up, mesa, tableland, plateau
Dunes	Fossil coastal dune, high dune	Coastal dune – unspecified, beach dune, recent dune, low dune, coastal sand hill		Inland dune, inland sand hill	
Streams	Permanent lake, river, stream, watercourse, levees and/or their banks	Seasonal or intermittent creek, gully, drainage line, ravine, gorge, outwash		Inland channel country, stream distributary system, intermittently flooded	
Water	Freshwater lake, lagoon, spring	Freshwater swamp, marsh, soak, seepage area	Gilgai, melon hole, sinkhole	Saltwater, sea, swamp	

SITE DESCRIPTION (Choose within 50m of centre of ESU or area assessed)								
Slope	Level (<1%)	Gently sloping (1-4%)	Moderately sloping (5-10%)	Strongly sloping (11-24%)				
	Moderately steep (25-38%)	Steep (39-55%)	Very steep (56-100%)	Slope >100% (45°)				
Aspect	N	S	E	W	NE	NW	SE	SW	Nil
Soil Colour	White	Yellow	Orange	Brown	Red			
	Black	Grey	Pale	Dark	Mottled			
Soil ('field texture grade in order of increasing clay content L to R, hatching indicates >20% clay content)	'Sand'	'Loamy sand'	'Clayey sand'	'Sandy loam'	'Loam'	'Silty loam'		
	'Sandy clay loam'	'Clay loam'	'Clay loam sandy'	'Silty clay loam'	'Light clay'	'Light medium clay'		
	'Medium clay'	'Medium heavy clay'	'Heavy clay'	(Saline mud)				
Erosion	Absent	Scattered	Frequent					
Erosion Type	Tunnelling	Sheet	Rill	Gully	Mass failure	Stream-bank		

DISTURBANCE within ESU or 100m x 100m area (circle assessment – random meander)						
Land use	Grazing	Forestry	Cropping	Conservation	Mining	Other: Historical clearing
Evidence	Clearing	Cultivation	Regrowth	Logging	Thinning	No disturbance
Dieback	0%	1-25%		26-75%	>76%	n/a
Site condition	Very good	Good		Moderate	Poor	Degraded
Fire scars	Absent	Scattered	Frequent	Time since	Recent	Old	Average Height (m)	
Disturbance notes						

VEGETATION STRUCTURE and CONDITION assessed within ESU or 100m x 100m area (circle assessment – random meander)												
Macrohabitat(s) present	CEST	Rf	H	FOR	WDL	GRL	IMP	LKE	RIP	SHR	SW	DIS
Key: CEST-Coastal & estuarine; Rf-Rainforest (including SEVT); H-Heath; FOR-Forest; WDL-Woodland; GRL-Grassland; IMP-Improved pasture; LKE-Lake/dam; RIP-Riparian; SHR-Shrubland; SW-Swamp/Wetland; DIS-Disturbed areas (e.g. roadsides, cropping land, urban areas).												
Ecologically dominant layer (EDL)	T1			T2		S1			S2		G	
Avg. height (m) of EDL	12					Avg. DBH (cm) of EDL			30			
Canopy cover (%) of EDL	>70% (dense/closed)			30-70% (mid-dense)		10-30% (sparse)			<10% (very sparse)		n/a	
Functional shrub layer density (<2m)	Dense/closed			Mid-dense		Sparse			Very sparse		Absent	

Threatened Flora and Weeds (locations and locally significant)		
Threatened Flora	Found on Site – records below	Not Found On Site
Weed infestations	Found on Site – records below	Not Found On Site

Threatened Flora and Weeds (locations and locally significant) Locations across ESU					
Species	Density*	Waypoint/Polygon	Easting	Northing	Photo number
Opuntia tomentosa					

*** Scattered/Low = <10% of area, Medium = 10-30% of area, High = >30% of area; if confined to a specific location(s) across ESU estimate the number of individuals/stems per 100m² (10m x 10m) and provide GPS coordinates.**

Ecological Field Survey ORG-ARW-HSM-FOR-00067

targetzero

VEGETATION PLOT/TIC (record all species within 50m x 10m transect)

Transect Start compass bearing	S	Start Easting	56J 0277049			End Easting	56J 0277078				
		Start Northing	701 4876			End Northing	701 4818				
Stratum	E	T1		T2		T3		S1		S2/Seedlings	
Height range (m)		10	14	5	8			0	2		
Canopy cover (%)		30		40				10			

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						
Eucalyptus populnea				9	5			
Eucalyptus tereticornis					2			
Callitris sp					8			
Acacia Deanii							2	
Aristida capot_medusae								
Sida Hackettiana								
Alloteropsis semialata								
Eragrostis sp								
Lomandra longifolia								

Ecological Field Survey ORG-ARW-HSM-FOR-00067

target zero
► zero incidents ► zero injuries

Common name/collection name	Species name	Sample (Field No.)	Stem Count (50m x 10m plot) or (50m x 2m plot for dense cover in S1 and S2) – Denote plot type employed					
NB: Record ground cover species within 50m x 10m transect			E	T1	T2	T3	S1	S2
		TOTALS						

GROUND COVER (five 1m x 1m quadrats along 30m transect)						
Five 1 x 1m ground cover plots:	1	2	3	4	5	Mean
Photo #	133	134	135	136	137	
Native perennial grass	30	68	75	95	81	69.8
Native other grass (if relevant)						
Native forbs and other species (non-grass)	3	2			4	1.8
Native shrubs (<1m)						
Non-native grass						
Non-native forbs and shrubs						
Litter	67	30	25	5	15	28.4
Rock						
Bare ground						
Cryptogams						
Total	=100%	=100%	=100%	=100%	=100%	

RE / SMALL EXTENSION MATRIX				
	RE Code	EPBC Status	VM Act Status	Biodiversity Status
Mapped RE	11.3.4	OC	OC	OC
Survey result	11.3.4	OC	OC	OC
Agree with mapped RE? If no, provide justification from field data	Uncertain. Very few tereticornis present, Pop Box is clearly dominant. Soils are alluvial. Potentially 11.3.2 could just be 11.3.4 fringe also.			

FAUNA HABITAT (within 50m x 20m transect)							
No. of trees with hollows (>10cm)	0	No. of hollow logs	2	Total length of logs (>10cm)	42	No. of logs (>10cm)	4
Per hectare (x 20)	0	Per hectare (x 20)	40	Per hectare (x 20)	840	Per hectare (x 20)	160

FAUNA HABITAT FEATURES (within 50m x 20m transect - for 20m x 20m plot)				
Habitat feature	Status			
Cliffs / outcrops	Absent ✓		Present	
Wetland / Swamp / Waterbody	Absent ✓		Present	
Waterway	Absent ✓		Present	
Potential for nectar / pollen	Absent	Scattered	Common ✓	Abundant
Potential for fleshy fruiting plants	Absent	Scattered ✓	Common	Abundant
Potential for seeding grass cover	Absent	Scattered	Common ✓	Abundant
Dense shrub/grass shelter	Absent	Scattered ✓	Common	Abundant
Large Eucalypts (>30cm DBH)	Absent	Scattered ✓	Common	Abundant
Large Non-Eucalypts (>20cm DBH)	Absent ✓	Scattered	Common	Abundant
Large rocks (>30cm)	Absent ✓	Scattered	Common	Abundant
Small rocks (10-30cm)	Absent ✓	Scattered	Common	Abundant
Leaf litter depth	Absent	Single layer ✓	Multiple layers	Deep layers
Leaf litter coverage	Absent	Scattered ✓	Common	Abundant
Termite mounds (>50cm)	Absent	Scattered ✓	Common	Abundant
Rock piles	Absent ✓	Scattered	Common	Abundant
Trees with shedding bark	Absent	Scattered ✓	Common	Abundant
Soil cracks	Absent ✓	Scattered	Common	Abundant
Koala feed trees	Absent	Scattered	Common ✓	Abundant
Mistletoe/Epiphytes	Absent	Scattered ✓	Common	Abundant

GREATER GLIDER HABITAT within 2 hectare area (ONLY to be completed in ESG 2 (2.0 and 3.0))			
No. of trees with hollows (>50cm)		No. of trees with hollows (>30cm)	

FAUNA SIGNS recorded within 50m x 100m area (habitat assessment – random meander)
Fauna signs: Animal tracks, Feed scars, Scratches, Diggings, Scats, Casts, Bones, Feathers, Other
Breeding places: Nests, Burrows, Shelters, Drays, Bowers, Other

Fauna Sign / Breeding Place	Likely Species/Group	Conservation Status (see below)	Coordinates (GDA94)		Other Information (e.g. age, collected, active/inactive)
			Easting	Northing	
logs + litter	general				

E	Endangered	Special Least Concern Species Echidna, Platypus, Migratory Species
V	Vulnerable	
NT	Near Threatened	
SLC	Special Least Concern	Colonial Breeding Species Microbats, wetland birds
CBS	Colonial Breeding Species	

EC Specimen collection – Site Preparation

	Required?		If required, why?
Fauna spotter/catcher	(Yes)	No	general fauna habitat
Ecologist	Yes	(No)	
Species Management Plan	Yes	(No)	
Minimal disturbance suitability assessment: Suitable – If all 4 questions are yes	Yes / (No) (Yes) / No Yes / (No) (Yes) / No		Is the vegetation suitable for slashing only? Is the slope < 5%? Is the clay content > 20%? Are gilgais absent?
Suitable for minimal disturbance?	(Yes)	No	
Notes			

North face of ESU

East face of ESU

South face of ESU

West face of ESU

Appendix F

LFC Tool Outputs

Department of Environment and Heritage Protection (DEHP)
Landscape Fragmentation and Connectivity (LFC) Tool version 1.4 LOGFILE
Process started at 20-12-2024 03:53:05 PM
Python version: 2.7.18 (v2.7.18:8d21aa21f2, Apr 20 2020, 13:19:08) [MSC v.1500 32 bit (Intel)]
Arcpy version: 10.8.1
Username: tstringer

INPUT PARAMETERS
Output Workspace: R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Arrow\OutputArrow
Threshold lookup table:
R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\scripts\lfc_v1p06_catalog\LFC_data.gdb\tbl_Regional_frag_local_threshold
Remnant cover layer: R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Arrow\LFC_data.gdb\ArrowRegVeg
Remnant cover layer edited: False
Regional buffer extent: 20 kilometres
Local buffer extent: 5 kilometres
Impact layer: R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Disturbance\New File Geodatabase.gdb\Disturbance_
layer projection: GDA2020_MGA_Zone_56
Raster cell resolution for analysis: 10 metres
Edge Width: 50 metres
(The distance from non-remnant landscapes through to the core ecosystem - the edge of remnant ecosystems)
Default projection: R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\GDA 2020 Queensland AlbersOFFSET.prj

15:53:06 Checking out the spatial analyst tool - required for LFC

15:53:06 _____BEGINNING LANDSCAPE FRAGMENTATION AND CONNECTIVITY ANALYSIS_____

15:53:06 This tool will categorise the landscape into:
{0: 'non-rem', 1: 'patch', 2: 'edge', 3: 'perforated', 4: 'core (< 100 hectares)', 5: 'core (100-500 hectares)', 6: 'core (> 500 hectares)', 7: 'water'}

15:53:19 R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Arrow\OutputArrow\lyr_file does not exist, creating it now.
15:53:19 Copying across impact site feature(s) and calculating area in hectares (AreaHA)
15:53:26 Making a local copy of the impact site
15:53:34 Preparing remnant cover layer for analysis
15:53:37 Created regional scale buffer of 20 kilometres
15:53:40 Created local scale buffer of 5 kilometres
15:54:38 Clipped the remnant cover to the regional buffer extent
15:54:48 Unioned the pre impact remnant layer with the impact site
15:55:23 Attributed the impact area as not RVM Cat B
15:55:23 Area of RVM Cat B clearing is 178.33 hectares
15:55:23 SQL selection used is "RVM_CAT" = 'B' and "Cover" = 'Not RVM Cat B' on shapefile R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Arrow\OutputArrow\main_output\clip_remcover_post.shp

15:55:48 Categorised the cover attributes in clip_remcover_pre.shp ready for raster conversion
15:56:49 Converted clip_remcover_pre.shp to raster

15:57:14 Categorised the cover attributes in clip_remcover_post.shp ready for raster conversion

15:58:15 Converted clip_remcover_post.shp to raster

15:58:15 Run Landscape fragmentation analysis on the pre impact regional landscape

REGULATED VEGETATION TYPES BEING EXTRACTED FROM LAND COVER
IDENTIFICATION OF CORE, PATCH, EDGE AND PERFORATIONS
COMBINING FRAGMENTATION CLASSES
CLASSIFYING CORE FOREST PATCHES BY AREA
COMPOSING FINAL FRAGMENTATION MAP
COMPOSING FINAL FRAGMENTATION MAP
(FRAGMENTATION CALCULATION TIME WAS 23.3 MINUTES)

16:21:35 Run Landscape fragmentation analysis on the post impact regional landscape

REGULATED VEGETATION TYPES BEING EXTRACTED FROM LAND COVER
IDENTIFICATION OF CORE, PATCH, EDGE AND PERFORATIONS
COMBINING FRAGMENTATION CLASSES
CLASSIFYING CORE FOREST PATCHES BY AREA
COMPOSING FINAL FRAGMENTATION MAP
COMPOSING FINAL FRAGMENTATION MAP
(FRAGMENTATION CALCULATION TIME WAS 22.4 MINUTES)

Extracting a local subset of lfc_regional_pre_impact
Extracting a local subset of lfc_regional_post_impact

Collating pre and post impact statistics and trigger assessment
16:45:16 Summarising area statistics for: lfc_localmsk_pre_impact
16:45:17 Summarising area statistics for: lfc_localmsk_post_impact
16:45:17 Summarising area statistics for: lfc_regional_pre_impact
16:45:20 Summarising patch count for lfc_localmsk_pre_impact
16:45:44 Summarising patch count for lfc_localmsk_post_impact

Analysing impact on Connectivity Areas

SIGNIFICANCE TEST ONE

The regional total area is 382890.39
The regional extent of core remnant is 126867.53
The regional extent of core remnant is 33.13 percent
This level of regional fragmentation sets a local impact threshold of: 10.0 percent

The table below lists the local impact thresholds for categories of regional core remnant extent:

REGIONAL CORE CATEGORY	LOCAL IMPACT THRESHOLD
< 10	2.0
10 - 30	5.0
30 - 50	10.0
50 - 70	20.0
70 - 90	30.0
>90	50.0

Area of core at the local scale (pre impact): 29097.35
Area of core at the local scale (post impact): 28568.68
Percent change of core at the local scale (post impact): 1.82 percent

SIGNIFICANCE TEST TWO

The number of core remnant areas occurring on the site: 13
The number of core remnant areas remaining on the site post impact: 12
(Only core polygons greater than or equal to 1 hectare are included)

RESULT

16:46:35 This analysis has determined a SIGNIFICANT impact on connectivity areas
(A significant reduction in core remnant at the local scale is False OR a change from core to non-core remnant at the site scale is True)
(Total area of RVM Cat B clearing is 178.33 hectares)

The significance table has been written to: ..\main_output\lfc_significance_assessment.csv
The local scale summary table has been written to: ..\main_output\lfc_local_scale_summary.csv
The site scale summary table has been written to: ..\main_output\lfc_site_scale_summary.csv
GIS layer files copied into folder \lyr_file within the project folder.
View layers in ArcMAP
using..\R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Arrow\OutputArrow\lyr_file\lyr_file\Connectivity Area Impact Assessment.lyr

Please scrutinise the output tables and spatial layers to confirm the desktop modelling of connectivity area impact

This analysis used an unedited copy of the Regulated Vegetation layer.

16:55:39 _____COMPLETED LANDSCAPE FRAGMENTATION AND CONNECTIVITY ANALYSIS_____

Department of Environment and Heritage Protection (DEHP)
Landscape Fragmentation and Connectivity (LFC) Tool version 1.4 LOGFILE
Process started at 15-12-2024 05:14:01 PM
Python version: 2.7.18 (v2.7.18:8d21aa21f2, Apr 20 2020, 13:19:08) [MSC v.1500 32 bit (Intel)]
Arcpy version: 10.8.1
Username: tstringer

INPUT PARAMETERS
Output Workspace: R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Gov\OutputGov
Threshold lookup table:
R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\scripts\lfc_v1p06_catalog\LFC_data.gdb\tbl_Regional_frag_local_threshold
Remnant cover layer: R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Gov\LFC_data.gdb\GovRegVeg
Remnant cover layer edited: False
Regional buffer extent: 20 kilometres
Local buffer extent: 5 kilometres
Impact layer: R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Disturbance\New File Geodatabase.gdb\Disturbance_
layer projection: GDA2020_MGA_Zone_56
Raster cell resolution for analysis: 10 metres
Edge Width: 50 metres
(The distance from non-remnant landscapes through to the core ecosystem - the edge of remnant ecosystems)
Default projection: R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\GDA 2020 Queensland AlbersOFFSET.prj

17:14:02 Checking out the spatial analyst tool - required for LFC

17:14:02 _____BEGINNING LANDSCAPE FRAGMENTATION AND CONNECTIVITY ANALYSIS_____

17:14:02 This tool will categorise the landscape into:
{0: 'non-rem', 1: 'patch', 2: 'edge', 3: 'perforated', 4: 'core (< 100 hectares)', 5: 'core (100-500 hectares)', 6: 'core (> 500 hectares)', 7: 'water'}

17:14:13 Deleted existing files in output folder
17:14:39 Deleted existing pre-impact file geodatabase
17:20:45 Deleted existing post-impact file geodatabase
17:20:50 Copying across impact site feature(s) and calculating area in hectares (AreaHA)
17:20:58 Making a local copy of the impact site
17:21:07 Preparing remnant cover layer for analysis
17:21:10 Created regional scale buffer of 20 kilometres
17:21:14 Created local scale buffer of 5 kilometres
17:21:30 Clipped the remnant cover to the regional buffer extent
17:21:33 Unioned the pre impact remnant layer with the impact site
17:21:39 Attributed the impact area as not RVM Cat B
17:21:39 Area of RVM Cat B clearing is 214.09 hectares
17:21:39 SQL selection used is "RVM_CAT" = 'B' and "Cover" = 'Not RVM Cat B' on shapefile R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Gov\OutputGov\main_output\clip_remcover_post.shp

17:21:43 Categorised the cover attributes in clip_remcover_pre.shp ready for raster conversion
17:22:38 Converted clip_remcover_pre.shp to raster

17:22:42 Categorised the cover attributes in clip_remcover_post.shp ready for raster conversion
17:23:37 Converted clip_remcover_post.shp to raster

17:23:37 Run Landscape fragmentation analysis on the pre impact regional landscape

REGULATED VEGETATION TYPES BEING EXTRACTED FROM LAND COVER
IDENTIFICATION OF CORE, PATCH, EDGE AND PERFORATIONS
COMBINING FRAGMENTATION CLASSES
CLASSIFYING CORE FOREST PATCHES BY AREA
COMPOSING FINAL FRAGMENTATION MAP
COMPOSING FINAL FRAGMENTATION MAP
(FRAGMENTATION CALCULATION TIME WAS 21.7 MINUTES)

17:45:19 Run Landscape fragmentation analysis on the post impact regional landscape

REGULATED VEGETATION TYPES BEING EXTRACTED FROM LAND COVER
IDENTIFICATION OF CORE, PATCH, EDGE AND PERFORATIONS
COMBINING FRAGMENTATION CLASSES
CLASSIFYING CORE FOREST PATCHES BY AREA
COMPOSING FINAL FRAGMENTATION MAP
COMPOSING FINAL FRAGMENTATION MAP
(FRAGMENTATION CALCULATION TIME WAS 22.4 MINUTES)

Extracting a local subset of lfc_regional_pre_impact
Extracting a local subset of lfc_regional_post_impact

Collating pre and post impact statistics and trigger assessment
18:09:09 Summarising area statistics for: lfc_localmsk_pre_impact
18:09:09 Summarising area statistics for: lfc_localmsk_post_impact
18:09:11 Summarising area statistics for: lfc_regional_pre_impact
18:09:14 Summarising patch count for lfc_localmsk_pre_impact
18:09:46 Summarising patch count for lfc_localmsk_post_impact

Analysing impact on Connectivity Areas

SIGNIFICANCE TEST ONE

The regional total area is 382890.39
The regional extent of core remnant is 126316.16
The regional extent of core remnant is 32.99 percent
This level of regional fragmentation sets a local impact threshold of: 10.0 percent

The table below lists the local impact thresholds for categories of regional core remnant extent:

REGIONAL CORE CATEGORY	LOCAL IMPACT THRESHOLD
< 10	2.0
10 - 30	5.0
30 - 50	10.0
50 - 70	20.0
70 - 90	30.0
>90	50.0

Area of core at the local scale (pre impact): 28537.93
Area of core at the local scale (post impact): 27631.92

Percent change of core at the local scale (post impact): 3.17 percent

SIGNIFICANCE TEST TWO

The number of core remnant areas occurring on the site: 4
The number of core remnant areas remaining on the site post impact: 4
(Only core polygons greater than or equal to 1 hectare are included)

RESULT

18:10:37 This analysis has determined any impact on connectivity areas is NOT significant
(A significant reduction in core remnant at the local scale is False OR a change from core to non-core remnant at the site scale is False)

The significance table has been written to: ..\main_output\lfc_significance_assessment.csv
The local scale summary table has been written to: ..\main_output\lfc_local_scale_summary.csv
The site scale summary table has been written to: ..\main_output\lfc_site_scale_summary.csv
GIS layer files copied into folder \lyr_file within the project folder.
View layers in ArcMAP
using..\R:\GIS\Geomatics_Shared\Scripts\MSES_MNES\4_LFC\Gov\OutputGov\lyr_file\lyr_file\Connectivity Area Impact Assessment.lyr

Please scrutinise the output tables and spatial layers to confirm the desktop modelling of connectivity area impact

This analysis used an unedited copy of the Regulated Vegetation layer.

18:20:06 _____COMPLETED LANDSCAPE FRAGMENTATION AND CONNECTIVITY ANALYSIS_____